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Moss Paper.

In 1825, a Hollander named Van Houten obtained an English patent for a new species of paper or felt made from moss. The process of manufacture is quite simple, and applicable, we presume, to various kinds of mosses growing in this country. The patentee, in his specification, gives the following information:

The material to be employed for this purpose is moss, such as grows upon low heaths and moors in Holland; and which may be found, as the patentee supposed, in many parts of England. This moss is to be gathered, washed, cleaned, and dried, and then cut into short lengths in an engine, such as is employed for cutting tobacco. The cut moss is then to be mixed up in the manner of preparing pulp for making paper, and when so mixed, is to be molded into sheets, in a frame, as paper is molded. The sheets are then to be pressed, in a heap, between blankets, and afterwards hung up to dry upon lines, as paper. When perfectly dry, the sheets are to be again pressed, in order to bring the material into close contact; and they may be considered as fit for use.

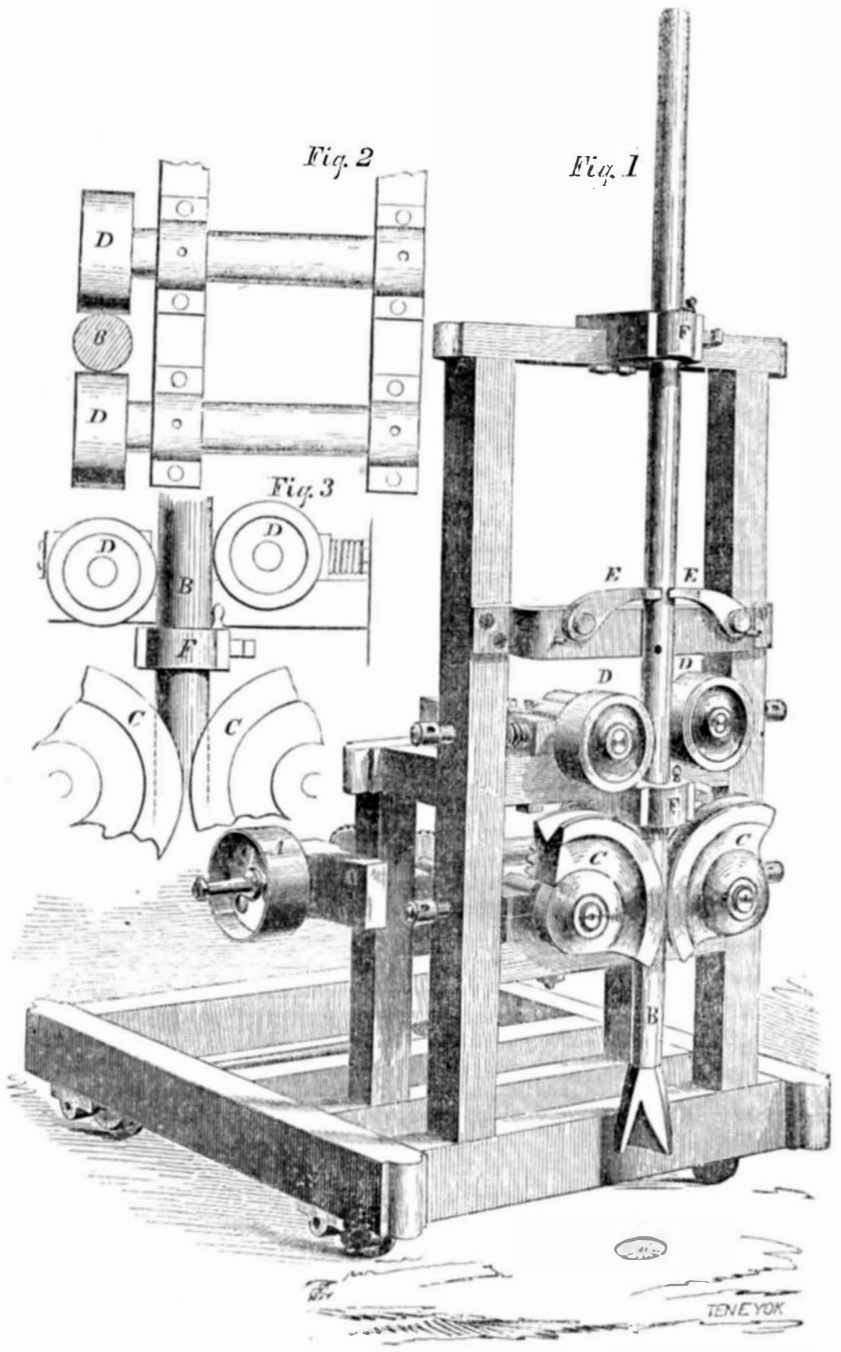
This paper, or felt, was proposed to be employed for sheathing of ships' bottoms, between the wood work and the copper; and also for lining between the thicknesses of planking; and likewise as an infallible preventive against leaking, as, upon the insinuation of water between the joints of the copper or wood work, this felt or paper absorbed the wet as a sponge, and thereby swelling, filled the vacant spaces, and rendered the vessel water tight.

Such a material was employed, for some time, in the Dutch navy, and found perfectly efficacious is keeping the vessel dry; and so extremely durable is moss, that the patentee considered that it would never decay, but would remain sound and effective as long as the wood work of the ship lasts.

American Spiral Bullets in England.

English papers state that the interior spiral bullet of J. W. Cochran, of this city, described by us in the last volume of the SCIENTIFIC AMERICAN, has been highly approved in England, where the inventor now is, for the purpose of introducing it there. This bullet, having three spiral grooves in its interior chamber, and a very minute passage at the point, receives a whirling motion round its long axis when discharged from a smooth bored fire-arm, and has, therefore, the same direct flight as a ball discharged from a rifle. Numerous plans have heretofore been tried to give bullets such a motion from smooth bored firearms, but they all failed, because they (the bullets) were formed with projecting spirals, and were, therefore, constructed upon wrong principles. The projections met with such a resistance in passing through the air, that their extent of range was greatly reduced. Cochran's bullets are smooth outside and of conical form, so that they offer less resistance to the air than a common rifle bullet. It is stated that he has received orders from the British Government for manufacturing a great number of his shot for cannons.

GOULDING'S PATENT ROCK DRILL.



The accompanying engravings represent the Rock Drill for which a patent was granted to H. Goulding on the 20th Jan., 1853.

Fig. 1 is a perspective view of the drill. Fig. 2 is a top view, showing the position and bite of the friction rollers which turn the drill; and fig. 3 is a direct front section, showing the position of the clamps which lift the drill, and also that of the two turning rollers, D D.

It consists simply of a drill spindle supported by a proper frame, and raised between and by the action of two grooved wheels or cams, and allowed to drop when at the proper elevation; the drill being turned, as it falls, by the action of two small rollers, set at an angle, and operating as an additional guide to the spindle.

The views presented show a machine for operating a single drill perpendicularly. A is the drive wheel. B is the spindle, with drill attached. C C are the two grooved cams, or part grooved wheels. They are secured on separate shafts, and receive a rotary motion by bevel gearing connected with the shaft of the driving pulley, A. These cams alternately lift and set free the spindle, B, of the drill; D D are two small rollers set at an angle; they press against the spindle of the drill, and thus impart to it a rotary motion (to any required extent) as it falls. E E are two movable clamps, which, when in the position shown, catch the spindle as it is raised, and prevent it from falling; so that successive revolutions will raise it from a shaft of any depth. These clamps are thrown open during the act of drilling. The drill and spindle, B, can be removed entirely from the machine without disturbing the position of the frame. This is done by confining it to work in the frame by two clasps, F F, which have but to be unlatched to remove the spindle. This is a very convenient arrangement for putting in and taking out the long drill spindle. As the section grooved pulleys, C C, rotate, they lift the drill spindle to the hight of their described peripheries, and set it free, when it immediately drops down by its own gravity.

When descending it receives a slight turn from the angular set rollers, D D, and strikes a new spot every stroke, as shown by the star-shaped hole, figure 1, beneath the drill. This is a very simple and unique method of lifting and turning the drill. This drill can also be set to bore horizontally, or at different angles, by a simple appliance in addition to those described. For stone quarries this drill can be so arranged as to operate a series of drills in direct line with each other. It is also adapted for Artesian wells, as it bores accurately and rapidly, and is easily managed. For Artesian wells, where it is sometimes required to pass through strata of earth, clay, and rock, the ordinary scoop and auger-shaped borer generally used for the two former, may be attached to the spindle, B, and the necessary rotary motion being applied by hand or simple mechanism. Its principal advantage is the accuracy of the work, and the rapidity with which the auger can be withdrawn.

From the testimony of those who have used this drill, and from a close examination into the mechanical construction of the machine, we think most of the difficulties which are experienced in other machines are overcome in this, and we would recommend its trial by those who are wanting a drill for the purposes for which this is adapted.

The patent is owned by a company in Boston, who inform us that a machine calculated for boring holes six inches in diameter, can be worked to bore granite at the rate of twenty-four inches per hour.

Further information may be obtained on application to Nathan Haskins, at the machine works, corner of Haverhill and Traverse sts., Boston, or T. H. Leavitt, Treasurer of the American Rock Drill Co., No. 1 Phœnix Building, corner of Exchange Place and Devonshire sts., Boston.

Statistics of Cincinnati.

The city of Cincinnati is a prosperous place, as the annual statement of its trade and commerce—by Wm. Smith, Superintendent of the Merchants Exchange—shows. The annual value of its manufactures is $52,109,374. Its imports annually are valued at $75,000,000, and its exports at $60,000,000. There are 6000 miles of railway now diverging from the city, and 4000 miles under construction.

The natural site of Cincinnati is very favorable. It is near the center of the rich Ohio Valley; which comprehends an area of 220,000 square miles, and railroads now spread out from it like the spokes of a wheel. Its manufactures are rapidly increasing, and must increase for ages, as it is situated in a great coal and iron district, which has untold millions of wealth reposing beneath its surface.

To Clean Sponges.

The best sponges imported are received from Smyrna, and from the shores of the islands in the Grecian Archipelago. When imported, they are full of sand, and in this state it is the best way to purchase them; then afterwards to beat out the sand with a stick, and well rinse them in cold spring water. Nothing is better adapted for cleansing the skin than a good sponge; hence surgeons prefer it to any other material. In the regular way of using a sponge with soap for washing, they rapidly become greasy, and are then frequently thrown aside, before half worn out. The peculiar cellular fibrous tissue of sponge enables it to decompose the soap, retaining the grease and oil, which render it slimy; when such is the case, a ley of soda should be prepared, of the strength of half a pound of soda to half a gallon of water, and the sponge placed to soak in it for twenty-four hours; it should then be washed, and well rinsed in spring water, and afterwards in water containing a little muriatic acid (a wine glassful of the acid to half a gallon of water is strong enough.) Finally, again rinse the sponge in plenty of spring water. The best sponge being worth from 40s. to 80s. per pound, renders it fully worth while to keep them clean. If trouble be taken to well rinse a sponge every time after using, the cleansing process will rarely be necessary.

SEPTIMUS PIESSE.

A Huge Propeller Screw.

The propeller for the U. S. new steam frigate *Wabash*, was recently cast at the foundry of Messrs. Merrick & Son, Philadelphia, and weighed 11 tuns. It is composed of copper and tin—25,000 lbs. of the former, and 2,500 of the latter—the well-known gun metal. It has two blades, has a pitch of 23 feet, and is 17 feet in diameter—the largest propeller in the world.

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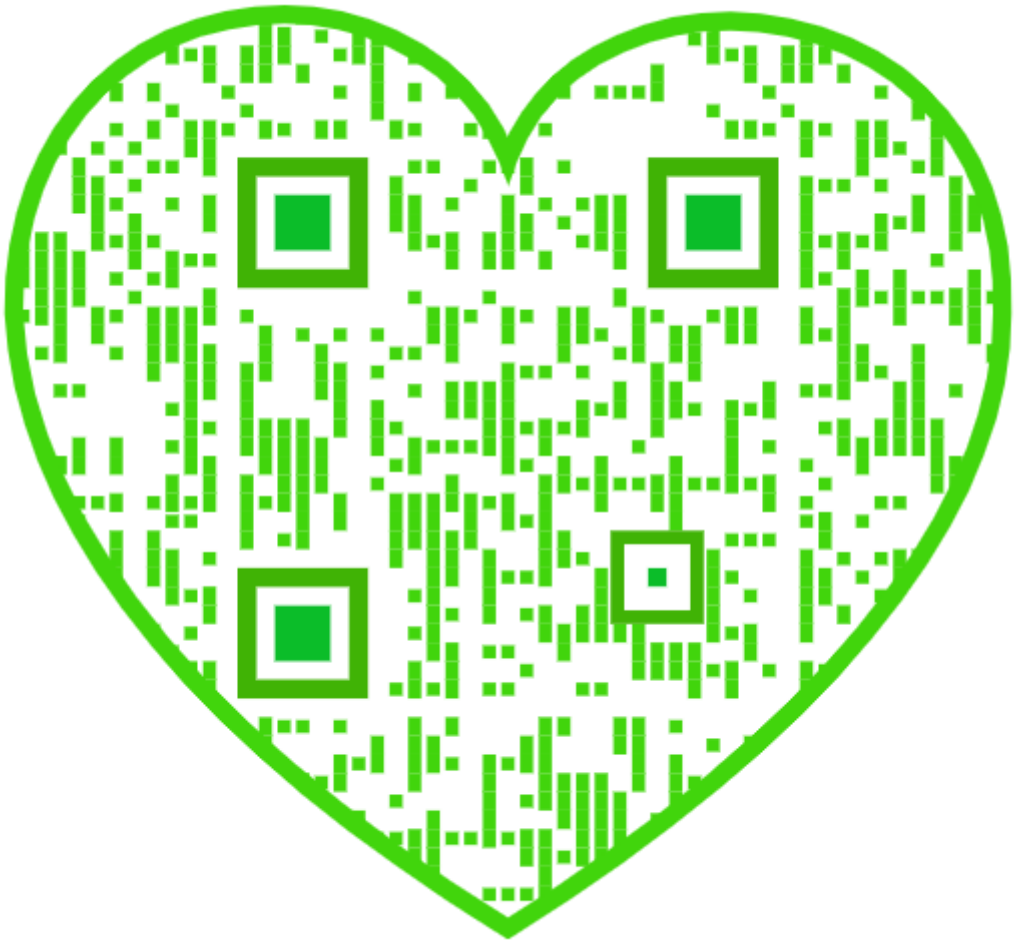

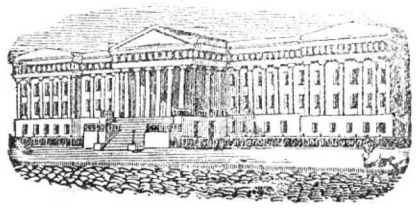

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING DEC. 18, 1855.

LOOMS FOR WEAVING PILE FABRICS—E. B. Bigelow, of Boston, Mass.: I claim the employment of a latch or hook, for successively drawing the pile wire from the cloth, when said latch or hook is constructed and operated substantially as specified.

I also claim, in combination with said latch, or hook, for drawing out the pile wires, the apparatus which receives the outer or head end of the pile wires, from said latch or hook, and transfer them to the face of the cloth, when said apparatus is constructed and operated substantially as specified.

GRAIN CLEANING—J. L. Booth, of Cuyhoga Falls, O.: I claim, first, in combination with the fan box, D, enclosing the fan, H, and provided with the hollow shaft through which the grain is fed, the cylinder, G, shell, A, and conical basin, K, arranged in the manner described for the purposes specified.

Second, I claim the inverted conical basin, K', with tube or pipe, L, provided with apertures, i, attached, in combination with the shell, A, cylinder, G, and fan box, D, substantially as shown and described.

Third, I claim feeding the grain into the space between the shell, A, and cylinder, G, by means of the hollow shaft, E, and arms, h h, arranged as shown, whereby the grain is evenly fed into said space, without interrupting or obstructing the current or blast which passes up through the cylinder, and the machine also rendered compact and efficient.

[In this invention there is a shell, having within it a revolving cylinder armed with scouring projections. The grain passes between the cylinder and shell, and is thus scoured. A blast of air from a fan above is also introduced between the shell and cylinder, passing down under the bottom, up through the interior of the cylinder, sucking up the dirt and impurities, while the clean grain falls out through an opening in the bottom of the shell. This is a compact smut machine, and apparently very effective.]

PIANOFORTES—S. B. Driggs, of Detroit, Mich. Patented in England, Nov. 1, 1855: I claim, first, securing the sounding board within a metallic frame, or its equivalent, substantially in the manner and for the purpose set forth.

Second, I also claim combining the sounding board and its enclosing frame, with upwar l projections from an open metallic base frame, and with a wrest plank, and an upper metallic frame, or hitch plate, by which I am enabled to make a pianoforte without using wooden blocks, or other wooden supports for the wrest plank, sounding board, and upper metallic frame, substantially as set forth.

Third, in connection with the combination of the upward projections from the open metallic base frame with the metallic sounding board frame, the wrest plank and the upper metallic frame, I also claim combining a thin bottom board, b, with a shallow wooden frame, which encloses the said open metallic base frame, substantially as set forth.

Fourth, in connection with the enclosure of the thin sounding board within a metallic frame, and the combination of said frame with the upper metallic frame, the wrest plank and the open metallic base frame. I also claim the combination of the said inclosed sounding board with the thin bottom board of the instrument, by means of a sounding post, for the purpose of adding additional stiffness and vibratory power, to both of said boards, substantially as set forth.

Fifth, I also claim supporting the strings upon metallic saddles, which stride the sounding board bridge, and are combined with said bridge, and with the sounding board, substantially in the manner and for the purpose set forth.

[Much of the expense involved in the construction of a piano is spent upon the case. The bottom board is required to be very thick and rigid, in order to give proper support to the hitch plate, on which one end of the wires are attached, and the tuning block, or where the wires are wound or tightened. Other parts of the case are required to be proportionately strong.

The present invention consists in a new arrangement of frame-work for supporting the hitch plate, tuning block, &c., independent of the case; and in making the case very thin, so that its top and bottom shall become sounding boards, capable of vibration, like a violin; the volume of the instrument is thus said to be much increased and improved.

We understand that these improvements are of a very practical nature, that they materially reduce the cost of pianos, and at the same time improve their quality. A large company, it is said, has been formed or is forming to work this patent.]

SAW SET—T. C. Bush, of New London, Conn.: I claim the additional guard or stop, J, so constructed and arranged as to enable the operator to set the teeth of a saw alternately in each direction, without reversing the instrument or the saw, substantially as described.

NOZZLE FOR EXHAUST PIPES OF LOCOMOTIVES—W. E. Cooper, of Dunkirk, N. Y.: I am aware that in the various multiplied forms of exhaust nozzles, the steam of escaping vapor has been already formed into various shapes, one of which is, in effect, a ring, a conical plug being fitted in the orifice, to regulate the area of the opening, by varying its position, but none of these have been with the intent, nor have they produced the effect of mine, inasmuch as the blast has never been efficient, except on its outer surface.

I claim the blast nozzle described, which forms the escaping steam into a circle, or its equivalent, and permits the products of combustion to pass up both sides of the annular steam track, or current, as set forth.

ADJUSTABLE CRANK PIECE FOR AUGERS—J. Gourlay, of Ogdensburgh, N. Y.: I am aware of W. P. Barnes' invention, and therefore only claim the particular method of varying the length of leverage in handles, as set forth.

[The above bit brace is made like those in ordinary use, with this exception: the breast knob instead of being directly attached to the upper part of the crank arm, is fastened to a sliding piece, which moves in a groove in the arm. This permits the elongation of the upper part of the crank arm at pleasure. When thus elongated, a double crank is, in effect, produced; but at other times the tool is employed as a single crank brace. In commencing to bore a heavy piece of stuff the tool is used singly, but after the bit has taken hold, the slide is moved out so that both hands may be effectively employed. The improvement we regard as a good one.]

PADDLE WHEELS—F. W. Capon, of Newton, Mass. I claim the combination of one or more alleviators or skeleton paddles, constructed essentially as described, with each or any main paddle, or float of a paddle wheel, or propeller, the same being for the purposes as specified.

MOLDS FOR CASTING BELLS—Eber Jones, of Troy, N. Y.: I claim the so making of flasks for casting bells, the bodies of which are made of metal, so that the guides by which they are put together shall be turned or molded from the same centers from which the flasks themselves are coated with the lining, or covering of clay or loam, and forming said guiding surfaces, where they are constantly under the ready inspection of the molder, substantially as described.

AUTOMATIC FEED MOTION FOR SAW MILLS—Henry C. Green, of Clarence, Wis.: I claim the combination of the cones, L L, governor, D, and pulleys, S S, arranged and operating substantially as shown, for the purposes specified.

[All logs are more or less tapering in their form; they are larger at one end than at the other, consequently, in sawing, the saws have less work to do at the smaller end than the other. If a given quantity of power be applied to the saw it will move faster at the small end and diminish in speed as it progresses towards the butt of the log.

Mr. Greene's invention consists of a regulating apparatus, intended to maintain the same speed in the saw, and to increase or diminish the quantity of power applied, in accordance with the work; it is also intended, in case of stoppage by choking up of the saw, instantly to throw off the belts, shut down the water gate, &c., and so avoid accident. The apparatus comprises a series of cone pulleys and other connections ingeniously arranged. It appears to be an invention of much utility.]

FIRE ARMS—Joseph C. Day, of Hackettstown, N. J.: I claim, in addition to my former claims, granted to me in letters patent, first, connecting the two side pieces, B' and b2, between which the barrel is hung by a hinge, B3, and locking them by the projection, B4, and a corresponding recess, substantially as set forth.

Second, making the face of the sliding collar, D, of the shape of an arc, with a cutting edge, so as to act in combination with the rear end of the cartridge, as described.

Third, I claim the groove, C', and A2, in the breech and the rear end of the barrel, for the purpose set forth.

REGISTERING MUSIC—H. B. Horton, of Akron, O.: I claim, first, attaching the markers, b b, by which the notes are registered, to light springs or flexible bars, g g, which are so supported by the keys, when the latter are raised, or not in operation, as to hold the points out of contact with the roll, D, or other traveling sheet, upon which the notes are registered, until their respective keys are depressed, when losing that support the points fall, or are gently pressed upon the surface of the sheets substantially as set forth.

Second, the within described method of operating the bar marker, o m, by which the bars are registered, by making it sufficiently elastic to hold the point off the sheet, while it is left free, and striking it down in contact with the sheet, at intervals of time, bearing a proper relation to the movement of the sheet, by means of a hammer, applied substantially as described, and operated by a cam, S, on one of the rollers which supports and moves, or is moved by the sheet.

Third, the revolving vibrating indicator, a, arranged so as to be visible by the player, and operated substantially as described, and the cam, c, on the axle of one of the rollers, which drives, or is driven by the sheet, for the purpose of marking the time to lead or guide the player.

Fourth, attaching all the note markers and the bar marker, and the upper guide of the rods through which the keys support the note markers, to a frame, k k, so that the whole can be moved simultaneously, in a lateral direction, to mark in different lines, substantially as and for the purpose set forth.

[Composers and extemporizers of pianoforte music have long been in want of some contrivance that should register the notes of a musical composition as fast as they were struck upon the instrument. Many attempts have been made to produce such an apparatus, but never, we believe, with real practical success. Their parts have generally been too complicated and uncertain for utility. The present invention is believed by the inventor to have overcome all previous difficulties. It consists in placing across the top of the piano a frame, in which an endless apron of paper or other substance is made to revolve by means of a weight or spring. A series of light perpendicular rods extend down from the frame, the lower ends of which rest, one upon each key. The upper ends of the rods are furnished with markers; whenever a key is pressed the rod which rests upon it also falls, and its marker touches the revolving paper, leaving a mark indicative of the note touched. When the finger is removed the key rises and carries up the marker away from the apron. If the paper is lined off laterally and longitudinally, the composition may be easily read and copied by the operator. The length of the notes will be shown by the length of the mark.

The expense of this apparatus is not great. It is applicable to pianofortes, organs, melodeons, &c.; it involves no alteration in the construction of an instrument, and is easily attached to those in common use.]

MODIFYING FOCAL LENGTH OF THE EYE—Daniel Parish, of New York City: I claim the improved optical instrument described, for the purpose of improving and restoring the sight, by giving greater convexity to the eye when flattened, and also by depressing that organ when too convex, in the manner specified.

MILL SPINDLE STEPS—Isaac N. Parker, of Lewiston, Me.: I do not claim the step described in W. P. Coleman's patent, dated Oct. 1, 1851, as such are well known.

I claim the formation in the step of the oil reservoir, F, surrounding but separated from the spindle, and communicating with it by the opening, G, at its bottom, with the periphery of the spindle, substantially in the manner described, and for the purposes fully set forth.

SPIKE MACHINES—A. M. George, of New York City: I do not claim the jaws, B B', nor the toggle, C'', with the heading die, D, attached, for they have been previously used.

But I claim the friction roller, f, and lever, I, to which the cutter, k, is attached, when said roller and lever are placed upon adjustable centers, or pivots, or rods, e i, arranged substantially as shown, for the purpose specified.

[Spikes are required to be more or less sharp at their points, according to the stuff into which they are to be driven. The present improvement relates to a means of easily altering the cut of the point during the operation of making, so that the spike shall be sharp or blunt, as desired. The cutter which separates the spike from the rod out of which it is made, is attached to a swinging horizontal arm, so arranged by the inventor that its center may be quickly shifted. A change in the center of the arm causes a change in the angle to which the spike point is reduced. The patentee is the originator of several other very valuable patented inventions relating to spike machinery.]

PLANING FELLIES—Wm. W. Johnson, of Clifford, Pa.: I claim the combination of the lever, E, sliding in the arms, A, graduated as shown, with the graduated lever, F, and hollow cylinder or barrel, G E and F, being hinged, for the purposes set forth, or any device which is substantially the same.

POLISHING AND BURNISHING THE EDGES OF THE SOLES AND HEELS OF BOOTS AND SHOES—Jean Pierre Molliere, of Lyons, France. Patented in France, Jan. 5th, 1855: I claim, of even date with the French patent, the rotary hollow tools, capable of being heated to any degree by the admission of steam, or other heating medium, into the chambers through the hollow shafts on which they turn from the regulating valve cocks, v, for the purpose of polishing and burnishing the edges of soles and heels of boots and shoes, the whole constructed and operated, substantially as described.

MOUNTING THE "UPPERS" OF BOOTS AND SHOES ON LASTS—Jean Pierre Molliere, of Lyons, France. Patented in France, Aug. 19th, 1854: I claim the arrangement of the adjustable frame, I, and thumb screw, G, armed with its toothed clamp, H, which, pressing vertically upon the inner portion only of the heel, holds the last securely in its position, and gives free access to the parts thereof on which any work is to be done by the apparatus, the whole substantially as described.

SAW SET—Isaac Spaulding of Saratoga Springs, N. Y.: I claim the construction of the slides, E, substantially as set forth, and their arrangement with screws, D D, and B, and punch, F, operating in the manner described.

AUTOMATIC GATE FOR RAILROAD CROSSINGS—Geo. B. Pullinger, of Philadelphia, Pa.: I claim the combination of the mechanism attached to the railroad track, and operated upon by the locomotive or cars for detaching from and bringing in contact the notched end of the lever, M, with the end of the vibrating lever, K, with the upright spring levers, H, studs or projections, G, on the ends of the flaps, E, and the means of operating the flaps, F F, and gates or barrier bars, so as to enable the said gates or barrier bars to be depressed by the weight of the horse or other object, when no danger is to be apprehended from the near approach of the locomotive or cars, but prevent the said gates or barrier bars being depressed, to allow the passage on the track of any object, after the locomotive or cars having reached a point on the track sufficiently near the crossing to render the passage of such object unsafe, and yet allow the said object to depress the gate or barrier bar, through the agency of the inner flaps, F, to get out from between the same, in case the locomotive or cars should have reached the point where it operates on the inclined bars, N, to prevent the depression of the outer flaps, E, and consequently of the gates or barrier bars through this agency until after the passage, by the crossing of the said locomotive and cars, in the manner and for the purposes described.

PLANE FOR FINISHING GROOVES IN PATTERNS, &c.—John P. Robinson, of Matteawan, N. Y.: I claim constructing the plane stock, A, of triangular or three-sided prismatic form, the two lower sides forming a greater or less angle with each other, and the plane iron, B, fitted in the stock as shown, for the purpose set forth.

[The above invention consists in having the stock of the plane made in a triangular or three-sided prismatic form, the cutting edge of the iron being at the junction of its two lower sides, and shaped to correspond to the form of the sides, whereby half round and other grooves of different sizes may be cut. For pattern makers it is a very desirable tool, as there is scarcely any kind of groove that it will not cut.]

STONE DRESSING MACHINES—Oldin Nichols, of Lowell, Mass., and Ammi M. George, of Nashua, N. H.: We do not claim the use of fixed cranks or eccentrics to work the tools of stone dressing machines, for they have been used before.

But we claim the combination of the movable and adjustable eccentrics with the toggle joints for operating or driving stone-dressing tools, arranged and operated substantially in the manner and for the purposes fully set forth.

STUFFING HORSE COLLARS—S. B. McCorkle, of Greenville, Tenn.: I claim the cylinder, L, provided with teeth or rods, h, and operated by the roller, K, lever, Q, arm, O, and ratchet, N, for the purpose of feeding the straw to the plunger, C, substantially as shown and described.

[Horse collar blocks are stuffed much after the same fashion that sausage skins are filled. The leather for the collar is sewed up into tubular form, and placed lengthwise before a sort of cylinder and plunger. The old plan is to take a small bundle of the straw, which is cut into lengths of sixteen or eighteen inches, double the same in the middle by hand, and place it before the plunger; the latter sends the straw down into the leather, and packs it solidly, nest in nest. The present improvement consists in a contrivance which feeds the straw up in proper quantities, when the plunger comes forward, doubles the straw and rams it down into the leather. The hand operations before mentioned, are in this way avoided, and the work is better done. The invention effects an important saving of time.]

HORSE POWERS—Saml. Pelton, of New Windsor, Md.: I am aware that triple gear horse powers, constructed and arranged upon the same general principles as mine, is not new. I therefore do not claim this arrangement.

But I claim the improvement fully described, consisting in centering the wheels and pinions upon their several axles and bearings by beveling or dishing the wheels and extending their bearings in the manner described, whereby the pressure is equalized on the journals above and below each pinion and wheel, thereby preventing the unequal wear of the axles and journals, consequently avoiding every tendency of the gearing to twist and break.

I claim the mode of constructing and attaching the levers, U U U U, and levers, V V V V, substantially as described, for the purposes set forth.

SHINGLE MACHINE—Joel Tiffany and Milo Harris, of Painesville, O.: We claim providing a primary and secondary set of knives, B B', a primary and secondary set of feed rollers, C C', and obliquely grooved driver, D D' D2, a primary feed carriage, E, and a pair of secondary feed grippers, F F, and arranging and combining the whole, in the manner and for the purpose specified and shown.

[In this machine the shingle is placed edgewise on a short horizontal primary carriage and fed forward a certain distance, and being thus fed forward, passes between a primary pair of guide rollers, and comes in contact with a primary pair of strong planes, which takes off the rough. It then passes between a secondary set of guide rollers, and comes in contact with a secondary set of planes, which finish it. Both pair of knives are caused to gradually approximate and cut the taper by means of oblique grooves in the driver. As soon as the top of the shingle escapes from between the secondary planes, it is caught by a secondary carriage and drawn forward until its butt escapes from between the secondary planes, when it is discharged on the floor, finished in the most excellent manner.]

FELTING HAT BODIES—Isaac Searles, of Newark, N. J.: I do not claim the construction of a wooden cone, or of a set of planking tables, having their lower faces grooved, separately, nor yet the construction of a horizontal revolving bed, inside of a tube.

I claim the combination of the circular revolving bed, B, with one or more planking tables and one or more cones, constructed and operating, substantially as described.

HORSE COLLAR—Samuel Shattuc, of Henrietta, Ohio: I am aware that horse collars, in one unjointed piece, have been known and used.

I claim the key, F, screw key, E, and sections, A A', provided with the projections, D D', arranged as set forth, and combined with the washer, C, constituting a jointed collar, for the purpose described.

SEWING MACHINES—I. M. Singer, of New York City: I claim the mode of operation, substantially as described, for forming seams, by alternately making a long forward and then a short back stitch, by means of an eye-pointed needle, which merely carries a part of its thread through the cloth, or other substance, that it may be interlaced or concatenated, as set forth, whether the said mode of operation be applied, by the means specified, or any equivalent therefor, as set forth.

[We have seen a specimen of the work done by a machine made under the above patent. The seam appears to possess greater strength and elasticity than ordinary machine sewing. We are told that it will neither rip ravel, or pull out, nor can the thread, by any stretching of the material, be made to break.]

SUCKERS FOR PUMPS—Joseph Weis, of Bor lentown, N. J.: I do not lay claim exclusively to cone-shaped elastic substances as self-packing apparatus for pump buckets, the same having been used before.

But I claim the wedge-shaped block, G, with any convenient number of wings, in combination with the perforated hollow cone, C, and the similarly shaped piece of gum elastic, or other similar substance, E, arranged and constructed substantially as specified, the same to be applied as buckets or valves for pumps.

LOCKS—Thos. Bowles, (assignor to Robt. M. Patrick,) of New York City: I claim the shutter, o, so arranged, that being brought into action, when the bolt is withdrawn it shall cover the key hole, while the bolt is so withdrawn, as set forth.

I also claim the arrangement for withdrawing the bolt by a distinct movement of the key, after the tumblers have been set, such arrangement consisting of the lever, m, in combination with the link, k, and the bolt, n, as described.

ATTACHING HUBS TO AXLES—E. S. Scripture, of Green Point, N. Y.: I claim the plate, H, jointed or formed of two parts, and provided with flanches, f, as shown, in combination with the shield collar, F, and gasket, G, arranged substantially as shown and for the purpose specified.

[The common "patent axle" so extensively used for carriages, consists in securing the hub to the axle by means of three or more screw bolts. On the axle there is a collar, behind which is a round plate of iron. The bolts pass the whole length of the hub through this plate, where they are secured by small nuts. There are several objections to this mode of securing wheels to axles; the removal of the wheels for lubrication is very inconvenient, the collar wears away, &c.

Mr. Scripture's plan consists in hinging the circular plate and making it wider, in the form of a clasp, so that when closed it grasps the collar, and thus dispenses with the screw bolts. A hempen gasket moisted with oil is placed against the back of the collar and covered by the clasp plate—this insures perfect lubrication for a long time. To remove the wheel, it is only necessary to open the clasp plate.]

GALENA, OR LEAD ORE—Julius E. Schwabe, of New York City: I claim the method of treating galena, by means of common salt or its chemical equivalent, and sulphuric acid, in the manner and for the purposes as described.

PIANOFORTES—Hubert Schonacker, of Detroit, Mich. I claim constructing the instrument so that the strings shall rest on a fret at the nodal or octave points, or substantially similar rest, upon the bridge of the sounding board, whereby free vibration is allowed to the whole length of string, between the hitch pins and bridge on the wrest plank, substantially as described.

Second, though I do not, of itself, claim connecting the two strings of a note, with a single horizontal turning screw, I claim the connection of the two strings with the same screw, when that is combined with the employment of a fret, c, or other rest, merely supporting the string on the sounding board, at single points, and not confining it, substantially as set forth.

[Musical strings are not sonorous unless struck at certain points called "nodal points." In pianofortes it is common to arrange the strings in such a manner that the hammers shall always strike on one of these "nodal points." One feature of Mr. Schonacker's improvements consists in resting a "nodal point" of the string on a bridge attached to the sounding-board—an arrangement which insures the production of the propersound, no matter in what part the hammer strikes. The other feature relates to a method of tuning or tightening the strings, which, without a diagram, could not be conveniently described. Both appear to be useful inventions.]

REGULATING VELOCITY OF WINDMILLS—Jeremiah Burnit, (assignor to himself and James Clark,) of Pusey-ville, Pa.: I claim, first, causing the vanes or sails to traverse automatically, from or towards the center of the wind wheel, by means substantially such as described, and for the purposes set forth,

I also claim, in connection with the centripetal and centrifugal traversing of the sails, or vanes, the vertical adjustment of the same, viz.: causing the double lattices of which the vanes are composed, to expose more or less surface to the wind, by making the slats of one cover more or less the openings in the other, substantially as described.

WOVEN FABRICS—John Healey, of Bolton le Moors, England, (assignor to James Bishop, of New Brunswick, N. J.) Patented in England, Nov. 17, 1846: I claim the improvement in the woven fabric described, in which the weft is placed in a diagonal position to the warp.

COOKING STOVES—J. B. Lancaster, (administrator of J. R. Lancaster, deceased,) of Tampa, Fla.: I am aware that the space round a portable bake oven, heated by hot air has been divided in a manner to form two chambers, the outer one of which served for non-conducting material, and the inner one for the circulation of hot air. Also, that steam has been employed for the purpose of cooking, being generated by means of a cylindrical casing to the fire pot. Therefore I only claim as the invention of the deceased, the arrangement of parts as described and shown, for the purpose set forth.

[Mr. Lancaster's stove is intended for use in climates where the natural heat of the atmosphere is so great as to render it very desirable to avoid any artificial elevation of the temperature. The cooking is done by steam. The oven is surrounded by a water-tight jacket, communicating with a boiler below, in which the fire is placed. Both the oven and boiler are covered with another jacket, with an intermediate space which is filled with fine charcoal or other non-conducting substance. This prevents any external radiation of heat, and at the same time increases the temperature within the oven. Bread can be baking in this stove while, externally, the presence of fire would hardly be suspected. For the purposes intended it appears to be "just the thing."]

ORGAN MELODEONS—T. F. Thornton, of Buffalo, N. Y.: I claim providing an additional set of valves, F, and one or more additional sets of reeds, E E, arranged as described, in a position the reverse of the usual arrangement of valves and reeds, and extending the keys backwards, in rear of the fulcrum, to actuate the additional set of valves through push up pins, to play on the additional set or sets of reeds, at the same time as they actuate the other sets of valves, D, through the push down pins, to play the C C, which are below them, substantially as described.

[In ordinary melodeons the keys are quite short; they do not extend back like piano keys, but terminate just at the fulcrum. Attached to the under side of each key, in a melodeon, is a wire projecting downwards, known as a "push-down pin;" when a key is pressed, this pin comes in contact with a pair of corresponding reed valves opens the same, and musical sounds result. In the best melodeons each push-down pin opens two valves, so that for each pressure of a key, two different sounds are produced.

Mr. Thornton's invention consists in elongating the rear end of the key, and placing upon the upper surface of the extended part a "push-up pin," arranged in connection with an additional set of reeds and valves. The result is that whenever a key is touched, four musical sounds, forming a chord, are produced, instead of two, as heretofore. This is a striking improvement. The instrument is styled by the inventor an Organ Melodeon.]

LAMP EXTINGUISHERS—Elijah Richmond, (assignor to Ira Noyes,) of Abington, Mass.: I claim attaching to the cap or extinguisher a tube placed any desired angle with the same, leaving a clear space between the cap and its tube, as described, whereby the cap or extinguisher can be applied to or removed from the wick, without removing the said cap tube from the wick tube, as set forth.

DESIGN.

SHIPS CABOOSE STOVES—A. A. Lincoln, Jr., of Norton, Mass.

NOTE—More than one-third of all the patents granted last week, were obtained, as usual, through the SCIENTIFIC AMERICAN Office.

Persons wishing to apply for patents, or to consult with us respecting the patentability of new inventions, can do so at any time, free of charge. The present is an unusually auspicious time for inventors.

The Springfield (Mass.) *Republican* gives a history and engraving of the new City Hall in that city, which it claims to be the handsomest in New England. Cost of land and building, $100,000.

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How to Manufacture Saltpeter.

MESSRS. EDITORS—Depending, as we do, upon a foreign country for a supply of one of the "sinews of war," it becomes a matter of duty as well as of inclination, to endeavor to curtail in some measure the extent of our dependence. Your suggestion to "the powers that be," to offer rewards for the discovery of deposits of the substance in question, &c., as is the case with any suggestion laying the most remote claim to merit or value, is likely to fall upon barren ground.

Thus thinking, I should like to propose the following queries to our scientific men: First, is there any difficulty or objection to the manufacture of nitrate of potash in this country as well as in France, Holland, and Germany? Those countries, not being able to purchase from Great Britain, were obliged to look to their own resources, and have manufactured it artificially for years, on quite an extensive scale, from refuse animal and vegetable matter, combined with hydrate of lime and earth—old or second-hand mortar or plaster usually. This compound is disposed in beds, covered in from the rain, but admitting a free supply of atmospheric air, frequently turned over with a spade, and treated with a copious supply of putrid urine. When after a considerable period the salt is judged to have been formed, to the amount of four or five ounces to the cubic foot, it is lixiviated, and the solution treated with wood ashes, which decomposing the earthy nitrates, the earths are precipitated, and the nitrates unite with the potassa of the ashes. The solution is now cooled, and the lixivial salt crystallizes in dirty white crystals, which is the crude nitrate of potash, containing from 75 to 80 per cent. of pure niter.

A very elaborate description of the process is given by (I believe) M. M. Lavoisier and Thenard, of Paris.

Second, are the deposits formerly found in Virginia, Kentucky, Tennessee, Ohio, Maryland, North and South Carolina, and Georgia, exhausted?

At one time, not very remote, they (the deposits,) formed quite an item in the mineral wealth of these States, more especially Tennessee and Kentucky, from which most of the niter used in the last war was obtained.

Third, is it not highly probable that the western slopes of the Andes especially, and the whole equatorial region generally, embracing the Steppes of Brazil, the whole of Ecuador, Peru, Bolivia, Venezuela, and as far south as the Llanas of Buenos Ayres, Paraguay, and Uruguay—those immense plains trodden by countless hordes of animals, and basking in the fervor of a tropical sun—is it not highly probable that we should there find vast deposits of this explosive material?

And fourth, and lastly, Messrs. Editors, to yourselves more particularly:—Has there ever been any attempt made to use the chloride of nitrogen as a destructive agent in war? and has there been any form of fire arm invented for the use of chlorate of potassa as an explosive agent. QUIEN SABE.

Chicago, Ill.

[So far as we can learn, no successful experiment, at least, has ever been made to use the chloride of nitrogen or the chlorate of potassa, as a substitute for common gunpowder in fire arms.

Iron Steam Battery.

Mr. Stevens' "great iron steam battery, both shot and shell proof," for which Congress has appropriated some $800,000, is in progress. To work in quietness at it, says the *Nautical Magazine*:—

"An excavated dry dock was built on the grounds of Mr. Stevens, Hoboken, extending from the coffer dam at the margin of the river, to nearly the middle, and beneath one of the principal streets; within the enclosure around the adjacent grounds, is a building for necessary machinery adapted to punching, shearing, and drilling the sheets of iron, with lathes and other tools necessary for a machine shop, all driven by a steam engine, besides other necessary buildings of a secondary importance.—The vessel is now covered with her outside shell, and sufficiently developed to enable us to judge of the feasibility of the design. Her dimensions are as follows: 400 feet long, 45 wide, and 21 feet deep; she is to be provided with ten boilers, and two propellers driven by eight engines."

Flour Mills.

Thirty years ago, the flour mills of France, and most other parts of the continent, were of rude construction, and exhibited few traces of improvement from the constructions of the previous century. The corn mills in England, Scotland, and Ireland, had also been nearly stationary for the same period of time, with the exception, probably, of some changes and improvements effected by Smeaton and the late Mr. Rennie. At the close of the last, or about the commencement of the present century, the Americans, as well as ourselves, introduced the system of creepers and elevators, by which a considerable amount of labor was saved, and the operations of grinding rendered more complete; and from time immemorial it has been the custom to drive the millstones from a large spur wheel, round which they were placed, in the middle of the mill. This arrangement of the grinding process is still in use in many parts of France, and several exhibitions have given examples of some of their best mills on this principle. Like those of this country, they are nearly all of them continuous in the process of cleaning the grain, grinding, and dressing the flour. The millstones are generally driven by straps or belts, whilst those in England are almost entirely driven by gearing.

The contributions to the Corn Mill Department are numerous and interesting; and the contributors have shown no small degree of skill in the numerous forms and devices by which they respectively recommend their machinery to public attention. A flour mill, by Bourdon, of five pairs of stones, and driven by a turbine, on the principle of Poncelet, deserves especial notice, from the novelty of its design, and the facility by which the stones can be stopped and started. The turbine, with its cistern, is placed below, in the center of the stones, five in number, and the main shaft or spindle penetrates the first floor, and from thence ascends to the top of the mill, and in its passage gives motion to the different machines for dressing, cleansing, elevating, &c.

[The above is from Fairbairn's paper on the machinery of the French Exhibition, published in the London *Mechanics' Journal*. He was appointed a special commissioner, we believe, from England to France for this purpose, but although he is an eminent engineer, and by trade a millwright (having learned his trade in Scotland before he took up his residence in England,) this report of his on flour mills is very barren of useful information, and does injustice to himself. We have been informed by millers who had worked as journeymen in England, Germany, and France, that American flour mills are far in advance of those in Europe in the use of improved machinery. Had we a more minute account of the flour mills of Europe, their defects, or wherein they fall short of American mills, might be pointed out. In the last number of Hunt's *Merchant's Magazine*, we find an account of the commercial Industry of the city of Glasgow, by D. O. Kellogg, Esq., late U. S. Consul at that place, in which we find it stated, that in 1852, 16,569 quarters of wheat, and 20,609 barrels of American flour were received at that port, while in the first six months of 1853, 10,469 quarters of wheat, and 25,515 barrels of American flour were received. In the first year named, the amount of flour received was to the wheat as 1 24-100 to 1, while in the succeeding year the amount of flour had increased in the ratio of 2 62-100 to 1, the wheat importation had but slightly, while that of the flour had greatly increased; thus giving evidence of a growing preference for American ground flour. From all that we can learn, American flour mills are the best in the world.

Pennsylvania Coal.

The whole amount of coal sent from the anthracite regions this year, was about 6,400,000 tuns—an increase over 1854 of 700,000 tuns. It is believed that Pennsylvania has realized about $19,000,000 for these black diamonds. In the course of twenty years from this date, the coal of Pennsylvania will realize yearly more money than ever was obtained in a single year from the golden fields of California.

The Condensing and Cornish Engine.

MESSRS. EDITORS—I notice in the SCIENTIFIC AMERICAN of Nov. 3d, an answer to an interrogatory of H. H., of Virginia, respecting the relative economy of the Cornish engine, and the double-acting condensing engine, stating that "the double-acting condensing engine being well cased and carefully managed, the difference cannot be much." Allow me to suggest for your consideration, as well as that of "H. H.," and your readers generally, the following statement of facts:

Long experience and a variety of experiments have demonstrated that for each inch in the diameter of cylinder, the condensing steam engine will perform a duty of one million pounds—i. e., lift one million pounds 1 foot with the consumption of 94 lbs. of coal; thus a 10-inch cylinder will lift ten million pounds, a 50-inch cylinder fifty million pounds, an 80-inch cylinder eighty millions, &c., the 80-inch cylinder averaging eight times as much as the 10-inch cylinder, with the same amount of fuel—the steam pressure on the piston being the same in each case. The Cornish engine will fully equal this duty, while the crank engine will not quite come up to this figure. But allowing the two to be on an equality in this respect, we derive the following principle from the foregoing—the economy of the one is to that of the other as the diameter of the one is to that of the other. For example, let us compare the duties of a Cornish engine and a double-acting condensing engine, each of about 100-horse power, and working under an average pressure on the piston of 15 lbs. to the square inch, this being the most economical pressure for the condensing engine, in the one case, viz., of the single-acting or Cornish engine, the cylinder being fifty inches in diameter, the duty will be fifty millions; in the other case, viz., of the double-acting condensing engine, the cylinder being of but half the area or say, thirty-eight three-eighth inches in diameter, the duty will be but thirty-eight and three-eight millions.

Hence it appears that a Cornish engine will perform about 40 per cent. more economically than a double-acting condensing engine of the same power, each clothed in the same manner, expanding its steam equally, and in all particulars cared for alike. But allowing for all contingencies, and holding the advantages of the Cornish engine at as cheap a rate as is possible, I should not hesitate to guarantee for it a saving at the very least of 25 per cent, over any other engine or machine doing the same work now in use, or known by the mechanical world.

There may be, and if I am rightly informed, there are some specimens of a so-called Cornish engine here and there whose duty will scarcely exceed that of a good high-pressure (non-condensing) engine, as there are miserable failures in every class of engine built, scattered broad-cast throughout the land—but of these I do not speak. I compare engines properly constructed from approved models, of such also, I am happy to add, some are in operation in different parts of our country. J. WEST.

Norristown, Pa., Dec. 1855.

[Experience is the best, yea, the only test of the superior economy of one engine above another; and to the above statement of experience relating to the superior economy of the Cornish single-acting, over the common condensing double-acting steam engine, we cannot offer a single contrary statement. But we would like to know the *why* and the *wherefore* of this economy. Should not the common condensing engine, with a cylinder of 38 3-8 inches diameter, having a double stroke, be considered of equal area with the Cornish engine of fifty inches, if the same quantity of steam is used by both—the Cornish using as much during one, as the other during two single strokes. What is the difference?

Oil on the New York Central Railroad.

From the Report of Edward H. Jones, master mechanic, we learn that the average number of miles run last month (November,) on the Albany and Utica division of the above-named railroad, was 16 83-100 to one pint of oil, and during October 17 miles. The passenger engines oil up every sixteen miles running, and use more oil than the freight engines. Engine No. 56, David Apps, engineer, averaged 29 97-100 miles running to one pint of oil, and Robert F. Freeman, engineer of locomotive No. 40, averaged 28 77-100 miles.

Reform in the Patent Laws.

MESSRS. EDITORS—You have announced your intention of proposing amendments to the existing Patent Laws. Permit me to suggest a few hints and queries.

1. I perceive no necessity for more than *one* witness to the drawings or specification. It should be sufficient for the Justice who administers the oath to attest to the signatures of the intending patentee. There is no analogy between such documents and deeds, and other sealed instruments where two witnesses are usually required. This amendment would prevent much trouble. One witness can easily be procured, but it is not so easy to get two men together.

2. Does not the English practice allow the applicant to introduce into one patent varieties of application, which in our country would require more than one patent? It seems to me to be important that a certain latitude should be allowed to inventors, which, probably, would not now be favored by our Patent Office.

Without undertaking to be sufficiently exact in these hasty remarks, I would, however, suggest whether some provision like the following would not be advisable:

The applicant should be permitted to include in one patent the various methods occurring to him of effecting the general object proposed.

I think that, in fact, this permission is allowed by the existing law, but not so explicitly as to secure a corresponding practice in the Office, as I understand the practice to be.

3. I do not like the practice of compelling the applicant to disclaim whatever may occur to the examining officer as not within the claim. Let the applicant make his claim, and let the construction of his claim be the office of a judicial court, if need be, and not that of a mere examiner. To all practical purposes the great majority of applicants must submit to have their claims, (which ought to speak for themselves,) whittled away by a class of persons certainly not the best qualified to adjudicate upon such subjects.

4. I think there should be an an *express* provision of law that in all cases of doubt, the doubt should ensue to the benefit of the applicant, and the Patent Office should be required to conform to such rule.

5. Something definite should also be enacted as to what shall be considered a prior use of the patented improvement.

It seems to me that no use or practice which has been private, or merely transient, or which has not been continued in use should bar a patent. Not having time to examine minutely the present state of the law, the writer wishes the above to be viewed as suggestions for the consideration of those who propose to offer a more systematical and comprehensive reform.

A. B.

When to Wear India Rubbers.

We have noticed that many persons in our city wear india rubber overshoes in cold dry weather, to keep their feet warm. This is an injurious and evil practice. India rubber shoes are very comfortable and valuable for covering the feet during wet, sloppy weather, but they should never be worn on any other occasion; their sole use should be to keep out water. They should therefore be put off whenever the wearer enters a house, and be worn as little as possible, because they are air tight, and both retain and restrain the perspiration of the feet. The air cannot be excluded from them, or from any other portion of the body, for any length of time, without sensibly affecting the health. It is our opinion, that no habit tends more to good health than clean feet and clean dry stockings, so as to allow the free perspiration of the nether extremities.

Russian Sea Worms.

The British fleet has found a terrible enemy in the Sea of Azof, in the form of large and destructive sea worms peculiar to those waters. These attack the uncoppered parts under the water line of the ships, and bore through them with the rapidity of an old carpenter handling an auger. Vessels navigating these seas have to be sheathed to the water line, or else their days are soon numbered.

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New Inventions.

The New Mechanics' Hall at Worcester.

The above-named building for the Mechanics' Association of Worcester, Mass., as we learn by the *Transcript*, is now being erected, and from the description given of its design, we are of opinion it will be a credit to the intelligence and spirit of the Worcester mechanics. It is 100 feet wide in front, 145 in length, 70 feet high to the crown of the roof; and will have a front entablature rising above the roof, over the grand entrance, 16 feet in hight, making the total elevation 86 feet. The great hall will contain standing room for 3,113 persons, or 10,240 square feet of floor room, allowing 3 square feet to each. The style of the building is the Corinthian; a very excellent choice, we think. It is to be fitted up with ample accommodations for committee, conversation, and library rooms. The total cost of the building will be $55,000.

Rag Cutting Machines.

In all paper mills, one of the primary operations is the cutting of the rags into small pieces. This was formerly done by hand, the rags being drawn one by one over the edge of a sharp knife—a slow and expensive process. Machinery is now exclusively employed for this purpose. The credit of its origin belongs to Moses Y. Beach, Esq., formerly proprietor of the New York *Sun* newspaper. By reference to our patent records, we find that a patent was issued to that gentleman on the 11th of October, 1828—for a rag cutting machine—the first of the kind ever patented.

Hominy Machines.

The accompanying engravings are views of an improvement in Hominy Machines, for which a patent was granted to Ezra Fahrney, on the 15th of May last.

Fig. 1 is a vertical transverse section of the machine, and fig. 2 is a front view of it. The improvement relates particularly to that description of hominy machine which employs a revolving shaft with radial beaters within a stationary cylinder. The object of the improvement is to render such machines capable of self-feeding and discharging.

The nature of the improvement consists in providing the cylinder in which the corn is cracked with two self-adjusting slides, one arranged over the inlet or feed passage, and the other under the outlet or dipcharge passage in the bottom of the cylinder, and having these slides arranged in such relation to two cams, placed a short distance apart on the face of a wheel which has a slower motion than the beater shaft, so that at every revolution of the wheel they are both caused to open the feed and discharge passages one after the other, the discharge passage being opened first by the forward cam, and kept open until the contents of the cylinder have escaped, when, or as soon as the cam escapes by the slide, it will, by the action of a spring, be closed, and then the feed passage will be opened by the rear cam, and kept open sufficiently long to allow the proper quantity of corn to be cracked at one operation to pass into the cylinder, when the cam escapes, and allows the slide to adjust itself and cut off the feed.

A represents the cracking or breaking cylinder, and B the shaft of radial beaters arranged within it. C is the hopper placed over the cylinder, and has a hole in its bottom. E is the inclined discharge spout. F F' are the slides for the feed and discharge passages in the cylinder; the slide F serves for opening and closing the feed passage, and F' the discharge passage, fig. 2, which extends along the entire length of the cylinder; this slide is connected directly to a spring, I, which is attached at *m* to an arm, *b*, as shown in fig. 1, and the slide, F', is made solid, and is also connected through an arm, *c*, to a spring, J. The springs, I J, render the slides self-adjusting. K K are the cams on the face of the wheel, L; these cams are placed out of line with one another, so as to be in line with the slide arms, *b c*, by which the slides are operated, and are behind each other, so as to come alternately in contact with the arms of the slides, as shown in the figures. M represents a band leading from a pulley on the driving shaft, N, for giving a rapid motion to the shaft of breakers or beaters, and O a band running from a pulley on a screw wheel shaft, P, for giving a slow motion to the cam wheel, L. Q is a worm on the driving shaft for giving motion through the screw wheel, R, to the cam wheel shaft, P, as is evident from the figures.

The hopper is filled with corn, and the machine set in motion. As soon as the cam wheel makes one, or a part of a revolution, according to the positions of the cams, the cam, K, comes in contact with the slide, F', and gradually opens the discharge, and lets out whatever may be in the cylinder, this being done in a few seconds, the cam escapes by the aid of the spring, J, to adjust itself to its original position, and thereby close the discharge; the cam, K', now comes in contact with the slide, F, and opens it in a similar manner, illustrated in the dotted lines, fig. 1, and allows a sufficient

PATENT HOMINY MACHINE.

Fig. 1

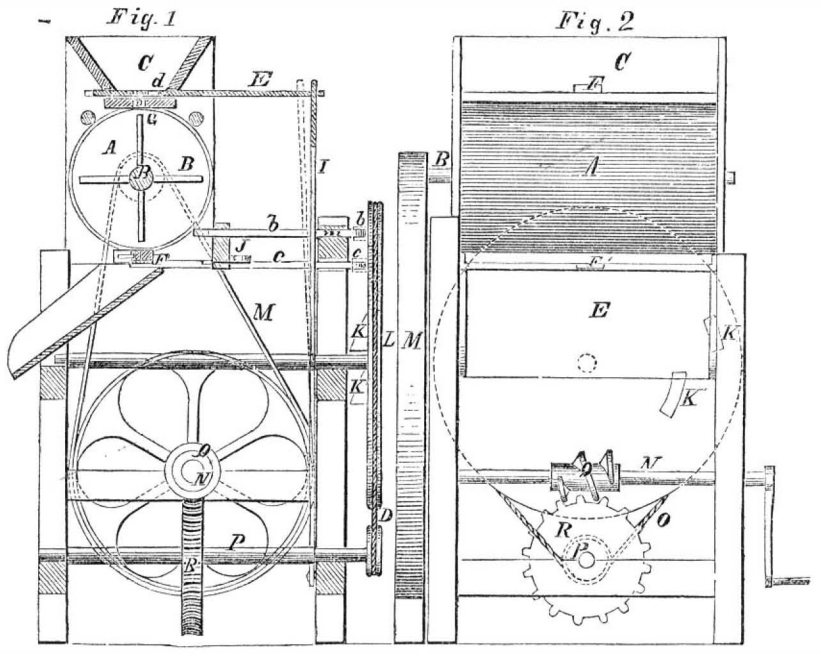


Fig. 2

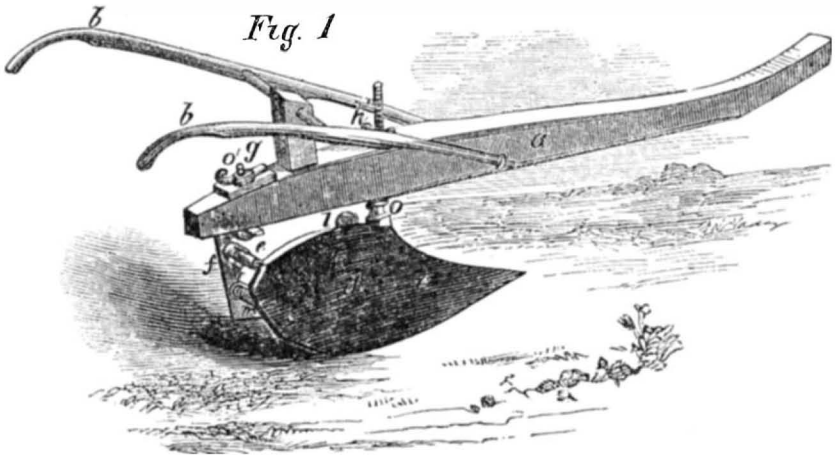
supply of corn from the hopper to be cracked at one operation, to pass into the cylinder by the time the proper quantity has been fed into the cylinder, the cam escapes by the slide, and allows it to assume its original position, and consequently to shut off the feed. The corn fed into the cylinder is operated upon until the cam again comes in contact with the slides, which does not occur until the corn has been sufficiently cracked, owing to the cam wheel being driven by a screw, which turns it very slowly, and thus the operations proceed in the most perfect and regular manner, without requiring an attendant.

This machine requires no attendant like the old hominy machines; the large hopper has but to be filled, and the machinery goes on breaking the corn, and feeding and discharging alternately, as has been described.

More information respecting this machine, and patent rights, can be obtained by addressing letters to John Donaldson—the assignee of the patent—at Mount Morris, Ogle County, Illinois.

EVAN'S PATENT PLOW.

Fig. 1



The accompanying figures illustrate the improvements in plows for which a patent was granted to L. G. Evans, of Spring Hill, Ala., on the 19th of June last. Although the plow is among the oldest of agricultural implements, and although numerous and valuable improvements have been made on it during the present century, it is believed to be still capable of improvement.

The nature of the improvement embraced in this patent plow consists in rendering both the mold board and land side of the plow adjustable at pleasure by means of convenient screws; also to elevate and lower the beam by slide, wedge, or other similar device.

Figure 1 is a shaded perspective view of the plow, and fig. 2 a linear perspective.

a is the beam. *b b* are the handles or stilts; *d* is the mold board; *c* is the coulter; *e e'* are adjusting screws. *f* is the upper part of the land-side. *g* is an adjusting screw; *h'* is a nut, and *h* is the standard; *k'* is a nut and screw, and *k* is a strap. *l* is a set screw, and *o o'* are adjusting screws, or they may be

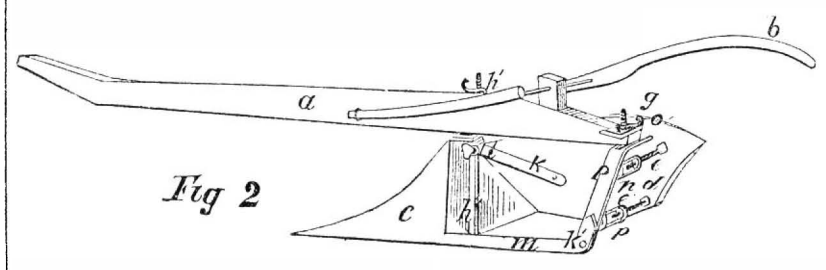


Fig 2

wedges; *p p* are pivot nuts; and *m* is the lower part of the land-side. The coulter, *c*, and lower part of the land-side, *m*, are cast in one piece, as shown, and are fastened to the beam, *a*, by means of the standard, *h*. The upper part of the coulter, *c*, is flattened a little, and drilled, in order to admit the standard.—The lower part of the land-side, *m*, has a staple, in order to admit the standard. The lower portion of the standard, *h*, is furnished with a spring, so that in putting the plow together when the standard has been drawn through the staple on the land-side far enough, the spring flies out and rests upon the upper edge of *m*, and acts as a support. The standard, *h*, and with it the coulter, *c*, and land-side, *m*, are fastened to the beam, *a*, by means of the nut, *h'*. The after part of the land-side, *f*, is made of a separate piece of metal. It is attached to *m* by means of a nut and screw at *k'*. This method of fastening the parts is simple, and at the same time so strong that a new land-side can be attached with expedition when desirable.

The upper end of *f* is bent to a right angle and slotted, and is secured to the beam, *a*, by means of the adjusting screw, *g*; or it may be made solid, and secured with a clamp, to permit it, together with the lower part, *m*, and the coulter, *c*, to be adjusted as desired. By loosening the nuts, *h* and *g*, the position of all the parts below the beam may be altered and adjusted, raised high or low, either to make the plow run shallow or deep, or to give it more or less land, as desired.

The mold-board, *d*, is made adjustable by means of the adjusting screws, *e e'*, having pivot nuts, *p p'*. These nuts are attached to the upper part of the land-side, *f*, while the adjusting screws, *e e'*, ore attached to the mold board, *d*. The other end of the mold board is secured to the standard, *h*, by means of the set screw, *l*, which passes through a hole in the upper end of the mold board. In this manner the mold board is secured to the standard, and is wholly independent of the coulter, *c*. This mode of fastening the mold board also permits it to swing at its juncture with the standard, so that when the plowman wishes to alter the width of the furrow, or diminish the draft of the plow, he has merely to turn the adjusting nuts, *p p*, and the mold board will be accordingly thrown in or out. The forward edge of the mold board, *d*, underlaps the after edge of the coulter, *c*, so that a smooth surface is always presented to the earth through which the plow passes. Plows have been before made having their mold boards adjustable by means of one adjusting screw at the after part of the mold board. But the forward end of the mold board of such plows is attached by means of screws to the coulter, and have but one movement.

By making this mold board independent of the coulter, and attaching its upper forward end to this standard, in the manner described, and by having two adjusting screws, the lower side of the mold board can be thrown in or out, as desired, and the position of the upper side can also be regulated. By attaching the mold board to the standard, according to this improvement, all that is necessary in adjusting the mold board, is to turn the adjusting screws, *e e'*.

More infornation respecting this plan may be obtained by letter addressed to the patentee, at Spring Hill, Marengo Co., Ala.

Black Lead Pencils.

The Calaveras *Chronicle*, Cal., gives an account of a large vein of fine plumbago having been recently discovered near Carson Valley. It crops out above the ground in a number of places; is about two feet thick, and four feet wide. California has thus added another valuable mineral to her other rich natural products.

There are very good veins of plumbago in various parts of our country, but hitherto our pencil makers have not succeeded in making pencils equal to those imported from abroad. Faber's are the most distinguished for drawing and are exclusively used for this purpose.

On a number of occasions we have directed attention to the value of an invention in the pencil line which would supersede pen and ink, but the discovery has yet to be made. A pencil that would give a clear, deep black stroke, and inscribe indelible characters upon paper, would make a fortune, we believe, to the inventor.—It is our opinion that such a pencil will yet be discovered, but when and by whom? that's the rub.

Ship Building in Maine.

Maine, during the last forty years, has built three-eighths of the whole United States tunnage. And though other States have immensely increased in their ship building of late, that State still enjoys the pre eminence.

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Scientific American.

NEW-YORK, DECEMBER 29, 1855.

How Machinery Increases Beneficial Labor.

About five years ago, when sewing machines were beginning to be introduced into this city, some furious attacks were made upon them by ignorant and mock philanthropists, who pretended to be anxiously concerned for poor seamstresses. They pictured the sad fate which awaited those persons; told how the hard-earned bread was to be taken out of their mouths by such capitalists as could purchase and use such machines, thereby dispensing with the labor of needlewomen, and thus bring them to want for lack of employment. Have such predictions been fulfilled? We who have for years carefully watched the effects of labor-saving machinery of every kind upon society, knew that such ideas, when uttered, were no better than the emanations of an idiot's dream, trusted to a few years' experience to prove the benefits of such machines to every class in the community. Thousands of such machines are now in operation in our country, and if we are rightly informed, more than a thousand of them are in operation in New York City alone; but instead of these having thrown any industrious females out of employment, they have rather increased the quantity of work for them to do. We were told a few days since, by one engaged somewhat extensively in providing needle work, that twenty stitches are now made on some garments, for one that was made five years ago—in short, that sewing machines had greatly increased the demand for sewed work. Thus coat linings, which used to be made plain, are now mostly elaborately worked, and finely stitched, and it is the same with almost every kind of sewed work. The amount of such work, he stated, had increased even in a greater ratio than the machines to execute it. A higher taste is now being gratified, and hundreds of women who used to ply the needle early and late with their fingers, for a mere pittance, are now better remunerated for their labor in attending sewing machines, while, at the same time, their hours of toil have been measurably reduced. It is our opinion that the very class—needlewomen—respecting whom so much was at one time said about being injured by sewing machines, will be the most benefitted. In many, if not in almost every instance, this has been felt to be the case already. Sewing machines, therefore, which are but a recent invention, afford abundant examples "how machinery increases beneficial labor."

Cause of the Open Polar Sea.

We have received a pamphlet by Samuel Hollingsworth, of Philadelphia, in which are some very ingenious speculations relating to the cause of the open Polar Sea discovered by Dr. Kane. He attributes it to the flow of a current of warm water from the equatorial to the polar regions underneath a colder current from the North to the tropical seas.—He says, "the water of the ocean at the equator and within the tropics is not only heated at its surface by the surrounding atmosphere, but is also heated at its bottom. This heat is derived from the earth, its temperature being elevated by the sun's rays passing through the water, and the water heated at the bottom to about 40 degs. rises to the surface, when it attains the temperature of 87 degs. The vacuum formed by the rising water is supplied at the bottom by the water flowing to it from the colder regions. This equatorial surface water would flow towards the north and return south [how could it do this?] were it not for the earth's diurnal motion, which gives it a westerly direction, and being confined by the north coast of South America, it proceeds along it to the Gulf of Mexico, where meeting with the North American continent, it takes a direction along our shores, and forms the Gulf Stream. This immense body of surface water flowing from the equatorial region, as it progresses northward, loses gradually its heat, until it meets with water colder than itself, which reduces it to 40 degs., at which point water is heavier than at any temperature above or below it. In this manner meeting with colder water—and consequently lighter than itself—it becomes an *under* current, moving onward in a direction opposite to that above it, towards the Polar regions, where, accumulating in an immense body, at a temperature of 40°, it forms an open Polar Sea. The Polar region thus becomes a basin as it were, to receive these under currents, thence they flow southward to restore the equilibrium at the place of beginning."

This is an ingenious theory. A wise Providence has constituted water with a quality by which it becomes heavier at 40 degs. than when it is formed into a solid (ice) at 32 degs. Were it not for this quality, our lakes and rivers would become solid fields of ice during winter. It is therefore a perfectly reasonable conclusion, that a warm under ocean current may be flowing to the Polar regions, but then we cannot see how these warm waters can *accumulate there*, unless by arresting both the upper and under currents.

A correspondent of the *United States Gazette*, Phila., endeavors to account for the Polar Sea by heat evolved from the rarified and cold air of the upper regions of the atmosphere, in consequence of the compression and condensation which it undergoes in descending to the level of the ocean, according to the theory of wind circuits set forth in Lieut. Maury's "Wind and Current Charts."

One of our correspondents—Wm. Slater, of this city—in a letter to us, "attributes the cause of an open Polar Sea to the earth being *concave* at its poles, and great heat being poured into that concavity." He believes that no under currents of the ocean could effect such a condition of things as an open warm Arctic sea. He also believes that there is a warm region at the North Pole, of an extent and capacity that might sustain a population equal to that of France. Thus three different persons have presented as many different views with regard to the open Polar Sea, and perhaps ten times as many other theories may yet be set forth. We entertain no positive opinion respecting its cause. We believe that another voyager to the Arctic regions might find the Polar Sea seen by Dr. Kane entirely covered with ice. We have come to such a conclusion from the fact of one Arctic voyager finding an open sea in one place, where another Arctic navigator, in a different season, saw nothing but impassable fields of ice.

Manufacture of Iron—Hot Blast; Saving of the Waste Gases.

This metal, in consequence of its comparative infusibility, and its invariable association with other mineral substances, which increase the difficulty of working it, was not brought into use until after other metals; but mention of it is nevertheless made in several parts of the book of Moses. That it was not, however, in general use 2000 years ago was proved by the discovery at Herculaneum of several cutting instruments made of bronze, which, before the introduction of iron, was commonly used for that purpose. Iron is manufactured from various ores, and the quality of the metal depends on that of the ore. Of all the various ores from which it is produced, the "magnetic" makes the best. This ore is found in great abundance in Sweden, and in the United States. A great magnetic iron ore region on our continent lies in the northern part of New York State, where, unfortunately, there is no coal. There are still, however, extensive primitive forests for making charcoal, which, although dearer, is much superior to coal, as it contains no sulphur. The best and cheapest iron for the manufacture of the best qualities of steel, should, therefore now be made in the State of New York, but such is not the case, for most of the steel used by our mechanics is made in England, from Swedish iron. The magnetic iron ore, although it produces the best quality of iron, is not so rich as the carbonate of iron, and yet this ore is not so much used as the common kinds of ore found in abundance in some of the coal districts. The association of iron with coal is an important advantage, as it requires about three tuns of coal for the production of one tun of iron.—Limestone, on which some coal strata rest, is eminently useful as a flux, for which purpose it is mixed with the coal and the iron ore, before they are thrown in the furnace. The first process to which the ore is subjected is that of roasting, for the purpose of expelling the volatile matters, particularly sulphur, the presence of which, even in small quantities, greatly deteriorates the quality of the iron. The furnaces in which the roasted ore is reduced are generally about forty-five feet high, and twelve feet in diameter at the broadest part, contracting towards the bottom, where the crucible that holds the melted metal is placed. The "tuyeres," or nozzles of the bellows that introduce the blast of air into the furnace, are cooled by being surrounded with fresh supplies of cold water, to prevent their being fused; and the continuous blast is kept up by a steam engine.

The quantity of air consumed in reducing iron ore exceeds in actual weight that of the ore, coal, and flux together, the proportions being seventeen tuns of minerals to twenty-two tuns of air. As the volume of air required is so immense, its entrance into the furnace tends to diminish the temperature, an effect which is prejudicial to the manufacture of iron. To lessen this cooling influence, the plan of heating the air before it is admitted has of late years been introduced with very beneficial effects; this is called the hot blast. The air is heated by passing it through a succession of hot tubes, and in this manner its temperature is raised to about 600 degs. of Fah. By the aid of the hot-blast, inferior kinds of ore and coals can be employed, which could not be worked by the former method, the good ore yields more abundantly, and the quality of the iron is greatly improved. A great improvement made of late years is in the employment of the waste gases of the furnaces for heating the blast, and for working the steam engine. The hot gases, as they pass up the chimney, instead of being allowed to escape directly into the air, are conducted under the boiler of the steam engine and among the pipes that heat the blast, by which means the fuel previously used for those purposes is entirely saved. It is a striking illustration of the unwillingness shown by some manufacturers to introduce any thing new, that the utilization of the waste gases of the furnaces has only been partially adopted in England and America.

Opposition to Inventions and Discoveries.

We live in better times than our forefathers; times of more enlightenment, and public candor in examining into the claims of discoveries and inventions, and in awarding their authors that honor and remuneration which they so justly deserve. It is sorrowful to reflect upon the sufferings which ancient inventors endured, for those heaven-born gifts, which now command so much admiration. Roger Bacon was forbidden to lecture; and when sixty-four years of age, was imprisoned in his cell for ten years, for the offence of making concave and convex glasses, the camera obscura, and burning glasses. Galileo was also imprisoned for his discoveries in astronomy, and good evidence of his being put to the torture secretly, for publishing his opinions, is not wanting. Guttemberg and Faust, the inventors of printing, were looked upon as having sold themselves to Satan, and were regarded with suspicion. We might present a long list of martyrs to science, discovery, and invention, but time and space would fail us. We rejoice that the days of such persecutions and trials are gone past forever. Still there may be many persons living in our day, who are imbued with prejudices against new projects and new discoveries, and may be given to the habit of sneering at new improvements in machinery, especially if made by inventors not engaged in the line of business which the machinery is designed to improve and advance. It is our opinion that such prejudices are not uncommon in factory and workshop, but they are wrong—very wrong. A machinist is liable to sneer at an invention made by a weaver if it relates to a tool; and a weaver to sneer at that of an engineer if it relates to a loom. These trade prejudices are perfectly natural, for the machinist may well consider that a weaver cannot be very conversant with lathes and drills; and the weaver may well exclaim, "what does an engineer know about a loom?" This is natural, we say, but not always correct. The man who is accustomed to work at one branch of business, becomes habituated to its very defects, and, in a measure, insensible or blind to them. On the other hand, a stranger to that business, if of an ingenious turn of mind, is more ready to notice such defects, and to plan and labor to make improvements.—This is perhaps not a general rule, but it has happened in very many instances. Arkwright was a barber, yet he invented a most valuable improvement in cotton spinning machinery. Whitney was not a maker of cotton machines when he invented the saw-gin. Cartwright, the inventor of the power loom, was an Episcopalian clergyman. Forsyth, the inventor of the percussion lock for fire arms, was a Presbyterian minister; and the Rev. E. Burt, of Manchester, Conn., was the inventor of the first American check loom. We could present a long list of inventors who have made valuable improvements on machines entirely out of their own line of business. In view of these facts, let us say to every man, banish every thought of prejudice against any new invention that may be brought under your consideration, no matter who its author may be. Examine the invention; do so carefully, and then candidly judge of its merits and demerits—judge it on its own account alone, for many good improvements have been prevented, for years, from finding their way into general use, simply because of prejudice in examining into their merits.

Franklin's Great Discovery.

In the last number of the London *Quarterly Review*, we find a just tribute of praise to Franklin. M. Arago, in his writings upon electricity, gives very little credit to Franklin for making the experiment which proved the identity of electricity and lightning. He says, "the first views of Franklin on the analogy of electricity and lightning, were only simple conjectures. The sole difference between him and Nollet was only reduced to the project of an experiment."

"This sole difference," says the Reviewer, "of which M. Arago makes so little account, was the grand difficulty to be overcome. The resemblances between lightning and electricity were too obvious to escape attention, and the idea, in fact, had occurred independently to three or four persons. 'If any one,' said Nollet, 'would undertake to demonstrate the notion, it would please me much.' It was just here where Nollet broke down. He could neither see what was the single link wanting to complete the chain, nor how to apply it.—Electricity was the rage of the day, and not one of its numerous students could hit upon the method any more than Nollet. The sole difference between Franklin and the rest resolves itself into this—that he did that which nobody else could do."

This tribute to the great discovery of Franklin, contains the kernel of the matter. The experiment of Franklin to prove the identity of lightning and electricity, was the most sublime ever performed. The old philosopher drawing lightning from the thunder cloud with a simple kite, well entitles him to the appellation of the "Lightning Tamer."

Horse Shoes by Machinery.

On the 19th of December last year, a patent was granted to Robert Griffiths, of Alleghany, Pa., for an improved machine for making horse shoes. Previous to this time, we have had no opportunity of examining into the nature of its action, and the principles of its construction, but during the past week the inventor has been exhibiting a model of it at the Johnson House, Warren street, this city, (where he may be found daily this week,) has explained its operations to us, and shown us specimens of its work. The iron bar of which the shoes are made is fed red hot into the machine, and is then cut off the required length, bent by levers, and formed upon dies, swedged and punched at one continuous operation. A working machine in Alleghany, we are informed, makes ten horse shoes, with ease, per minute, and judging from the specimen we saw, these require very little to be done to them afterwards to fit them for use. The shoes are well formed, and exhibit no straining of the fiber of the metal. This machine accomplishes at one continuous operation that which requires three and four different operations, on other horse shoe machines.

The wheat now held by the millers of Rochester, N. Y., is valued at over $1,000,000.

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Recent Foreign Inventions.

PRINTING ON METALLIC PLATES—Messrs. Adams and Gee, printers, London, have found that metallic plates of the thickness of ordinary sheet tin may be printed upon with the usual printing type, if the plates be first coated with a composition, the secret of the inventor. If sheets thus printed be afterwards subjected to a certain japanning process, an even lustrous surface is produced, which cannot be acted upon except by a sha p steel instrument. [A specimen of metal print is to be seen at the office of this journal.] It requires no great consideration to discover that this invention is of a very important character. It may be applied in any instance where printed matter is either to be exhibited, or even handled, for any length of time; and may be most advantageously substituted for the hitherto mounted paper lessons. However soiled a copy of the metal print may become by exposure to dust of every kind, it can be cleaned and washed, even without being taken off. The various tickets and signatures to be placed on covers, casks, or other parcels, can now be affixed in the same way.—[London Mining Journal.

SOAP—W. Gossage, chemist, of Lancaster, England, has obtained a patent for making soaps as follows: First, causing solution of soluble glass, or solution of silicate of soda, to be combined with soap produced by the union of tallow, resin, oil, or other such substances with soda, either by the method of working known to soap manufacturers as "close boiling without separation of lyes," or by the method of working known as the "cold process." Second, the manufacture of compound soap by causing resin, or such acid compounds as may be obtained from fats or oils by well-known means, to become combined with a solution of soluble glass, or with solution of silicate of soda, without requiring that resin or such compounds shall be previously in the state of combination with alkali. Third, the manufacture of compound soap by causing resin to become combined with soda, and adding to the product such a proportion of wheaten flour, or other farinaceous substance, or of some finely-divided argillaceous or silicious substance (such as China clay or ground flints) as will be sufficient to give such a degree of firmness to the compound soap produced as to render it suitable to be used as a hard soap for ordinary detergent purposes.

J. F. Anger, of London, has secured a patent for an alloy of metal which he describes as follows:—

"I melt in a crucible," says the inventor, '100 parts of good copper, and while in a perfect state of fusion, I add 17 parts of zinc, 6 parts of magnesite, or substance of a like nature, though perhaps differing in name, 3·6 parts of ammonia or salts of ammonia, 1·8 parts of quick lime or other calx, and 9 parts of crude tartar. The crucible is then covered, and the whole allowed to come to a complete state of fusion." The metal resulting from the above combination is said to resemble gold in several of its properties.

The Right Man for the Right Place.

It is related that a department of the French government, being desirous of making an extensive series of calculations connected with the decimal system, had formulas so prepared that large columns of addition, multiplication, and division could be worked to their results by persons whose knowledge was insufficient to comprehend the bearing of these processes on the general plan, and who had in fact but little more education than was necessary to accomplish their respective results. This saved the time of a higher class of mathematicians, who prepared these formulas, and accomplished thus each his portion of the plan conceived by the master spirit, who had struck out the whole. The immediate saving of expense was very great.

But the saving of expense was not the only advantage. The work was found to be better and more accurately performe . Those whose minds were at home in the higher processes of mathematics were often impatient of the details of long simple sums, and not fixing their minds exclusively upon them, frequently made mistakes, which persons who were doing the best they could would never have fallen into.

The principle involved in all this is one of the utmost importance in other things; indeed, all departments of the political economy of every-day life, in that each man will work best at the highest employment of which he is thoroughly capable—that which will call for the full stretch of his powers. It is a great mistake to engage a man merely because he can do it easily, and taking it for granted that he will be more likely to do it well. On the contrary, he will be less likely, as feeling no interest in it. It may be too easy.—[Philadelphia Ledger.

[There is a vast amount of philosophy in the above remarks.

Expanding Flying Bridge.

The London *Artizan* gives an account of a bridge, the model of which was recently exhibited by M. Lavancy, before the meeting of the Institute of Civil Engineers. It had been tried at Paris by being fixed upon a boat in the canal for permitting the passage of the troops. The boat yielded considerably to the weight of the men brought upon it, but the bridge remained stiff, and the commanding officer had reported well of its properties. The principle was that of a number of strips of iron or wood pinned together transversely at such points, so that they should form a series of equilateral parallelograms, the extension being obtained by the motion upon the connecting pins, on the principle of what was called "lazy tongs." A bridge of this description could be made very light for any ordinary span, and be conveyed upon a boat to be projected to both banks of a stream; be used for the center, or any portion of a long floating bridge of boats; be carried upon a pair of wheels with a regiment, or used for numerous civil purposes.

Preparation of Gun Cotton for Collodion.

M. Delahaye has communicated to the *Societe Francais de Photographie* a method he employs for obtaining invariably gun cotton for collodion, which is perfectly soluble. He immerses the cotton immediately, on its being removed from the mixture of nitrate of potash and sul phuric acid, in monohydrated nitric acid of 48 degrees. The immersion must be as complete as rapid, as the cotton cannot remain in the nitric acid without undergoing some modification; it must be instantly removed and thrown into the washing trough. In this operation M. Delahaye prefers distilled water, in order to avoid the saline substances contained in ordinary water, which always interfere with the collodion.

M. Delahaye bases his process upon this principle: that it is impossible, on a large scale, to make a gun cotton which shall be perfectly soluble by immersing the cotton in the usual manner, as the whole of it cannot fix such an amount of nitric acid as to form the compound C.24 H.17 O.17, 5 N.O.5, the formula necessary to give a perfect collodion.

Tunnels.

The United States has 67 tunnels on canals and railways, the longest of which is about 1 mile.

England has 48 canal tunnels of an aggregate length of 40 miles, the longest being over 3 miles, on the Huddersfield Canal. She has also 79 railway tunnels, 49 of which amount to 33 miles, the longest being 3 miles.

The longest tunnel of which record is one in the district of Schemnitz, in Hungary. Its length is variously stated at from 10 1-2 to 11 1-2 miles. It is used to drain an extensive series of mines, and also for the transportation of ore on railway cars.

In France there are 56 tunnels on railways, and 8 on canals, 36 of which are an aggregate length of 45·4 miles. The largest of small size is 7·45 miles, and that of large dimensions 3·5 miles. The Rouen and Havre road has 8 tun nels; Paris and Lyons also 8.

On the German railways are 10 tunnels.

In Sardinia there is a tunnel 2 miles long, through Mt. Giovi, on the Genoa and Turin railway. On this road, in 25 miles through the Apennines, are 9 tunnels.

Medals to Scientific Men.

The Council of the Royal Society, London, has awarded the Copley Medal this year to M. Leon Foucault, for his various researches in Experimental Physics; and the two Royal Medals to Mr. John Russell Hind, for his discovery of ten Planetoids, the computation of their orbits, and various other astronomical discoveries; and to J. O. Westwood, Esq., President of the Entomological Society, for his various Monographs and papers on Entomology.

Who was the Inventor of Steam Locomotives?

MESSRS. EDITORS—I beg leave to take exception to the following extract from the communication signed "Agathodemon," that appeared in the SCIENTIFIC AMERICAN of Nov. 10, 1855: "And again, but slightly turning the ever-changing kaleidescope, we see a Trevithick and a Vivian steaming their way o'er the iron-ruled earth," which, I suppose, means that the world is indebted to Trevithick and and Vivian for the invention of the locomotive. To support his position, "Agathodemon" will no doubt quote the great mass of English writers on the steam engine.

The editor of the first American edition of the second English edition of "Nicholas Wood's Treatise on Railroads," published by Carey & Lea, Philadelphia, 1832, at page 122 comments as follows upon Trevithick and Vivian's claim to the locomotive: "It is scarcely necessary to mention to the American reader, that the claim respecting the invention of high pressure steam engines, and of locomotive engines in Great Britain is entirely without foundation. The application of steam in this manner and to these purposes had, indeed, been contemplated, but not reduced to practice. Oliver Evans, of Philadelphia, commenced his experiments on high-pressure steam in Philadelphia in 1784. On the 21st of May, 1787, he obtained a patent for his engines on this plan, one of which was erected in Philadelphia in 1801. The patent, in addition, particularly describes the application of his engine to wheel carriages, which could be used even on common roads. A curious machine of the latter description was constructed by him for the corporation of Philadelphia in 1804. It was named *Oructer Amphibolos*. As no railroad then existed in this country, it traversed the streets of the city until it arrived at the Schulykill, a distance of one mile and a half; it was then placed on board of a boat, to which a wheel was attached at the stern, and it propelled this vessel to the mouth of the river, and thence to the Delaware front of the city, a distance of sixteen miles. It was subsequently employed as a dredging machine, being the *first application of steam* to this important, and now common purpose. In 1794-5 Mr. Evans sent Mr. Joseph S. Sampson to England with the drawings and specification of his steam engine, &c. They were exhibited to numerous engineers, and his plans were copied by Messrs. Vivian and Trevithick without any acknowledgment! The latter persons acquired fame and fortune, while the ingenious but eccentric Evans died poor, neglected, and broken-hearted.

Fitch, Fulton, and Evans exhibit a singular coincidence in their history. Posterity, at least, will render them the tardy recompense of justice.

America may, therefore, claim the invention of locomotive engines with even more propriety than the application of steam to navigation—inventions which are destined to revolutionize the commerce and defence of nations. See the "Young Steam Engineer's Guide," by O. Evans, Philadelphia, article on steam engine, American edition of "Ree's Cyclopædia," and also the "Edinburgh Encyclopædia," "Renwick on the Steam Engine, &c., American edition." In addition to these authorities, Olinthus Gregory, member of the Institution of Civil Engineers, and Professor of Mathematics in the Royal Military Academy, in his work entitled "Mathematics for Practical Men," London, 1833, at page 359, speaks of the high-pressure steam engine as "constructed upon a principle in which simplicity and power are blended, as far as possible, and in which the parts are arranged in such a manner as seemed best calculated to facilitate the comprehension of these machines to such as have not already had an opportunity of examining them carefully. The construction is due to Oliver Evans." And yet, strange to say, at page 366 of the same work, he states that the locomotive was invented by Mr. Trevithick, of Cornwall, forgetting that the locomotive is constructed upon identically the same principle as the high-pressure steam engine, which was brought into being through the efforts of Oliver Evans to obtain a motive power for his steam carriage. Dr. Lardner, more consistent, though far less scrupulous than Professor Gregory, claims both the high-pressure steam engine and locomotive for Trevithick. The greatest concession by English authority to the claims of America to the locomotive, appears in the *Mechanic's Magazine*, published at 115 Fleet street, London, in the number dated Sept. 25th, 1830, under the heading "The first projector of steam traveling," appears the following: "At a time when traveling by steam is coming so much in vogue, and there are so many rival pretensions to the honor of devising and promoting this new mode of conveyance, we think we shall be rendering a service to the cause of truth, and doing justice to the memory of a most ingenious and worthy individual by re-publishing the following interesting piece of autobiography. It will be seen that there is but little now accomplishing in this branch of improvement which was not half a century ago anticipated, and even practically accomplished by Oliver Evans, an American citizen." The editor then gives almost the entire exposition made by Oliver Evans of the difficulties attending the introduction of the high-pressure engine and steam carriage, the prejudices he was forced to combat, &c., &c., all of which is, no doubt, familiar to you, Messrs. Editors.

I will close this communication with remarking that among some of our citizens, holding a high rank for general intelligence, the most deplorable ignorance exists with respect to the history of the steam engine and locomotive. About four years ago, a gentleman *eminent* for his legal acquirements, while presiding at a railroad convention, spoke of Robert Fulton "as the great father of steam machinery." Very many respectable people believe Fulton to be all this gentleman represented him, and that to him is due the locomotive, steamboat, &c., and look upon those as mere envious detractors who advance the claims of Fitch, Rumsey, and others. These persons would, by giving credit to the true authors of great inventions, not only be rendering a service to the cause of truth, but the claims of semi-barbarous America, (in the eyes of some Europeans,) to the invention of the locomotive in the land that gave birth to those great adjuncts of civilization—the steamship and the magnetic te'egraph. JUSTICE.

Philadelphia, 1855.

[In 1784 Wm. Murdoch took up the idea of a steam carriage suggested by James Watt, and built a Liliputian working locomotive, which he run for amusement on the highway; this small locomotive is still in existence. D. K. Clarke, in his work on railroad engineering, gives Trevithick the credit of the introduction of the steam engine on *railways* in 1804, and no doubt this is correct; he was also the inventor of blast in the chimney. Europeans have not denied the just claims of Oliver Evans. On page 321 Herbert's History of the Steam Engine, published in London in 1832, we find the following: "The party who first attempted to put them (steam carriages) in practice by mechanical arrangement of his own is entitled to the reputation of *the inventor*. Mr. Oliver Evans, of America, appears to us to be the person to whom this honor is due."

Life at the Bottom of the Deep Sea.

The U. S. ship *Vincennes*, of the North Pacific Expedition, in its recent exploration off the coast of Kamschatka, obtained bottom at a depth of 1700 fathoms with the line, and took up some very minute specimens of sea infusoria on it. These, when submitted to the microscope, appeared to have been living but a few moments before, and were supposed to have died when brought near the surface, and relieved from the immense pressure of the superincumbent water. These infusoria give evidence that they were designed to live under circumstances which, hitherto, have been supposed fatal to all animal organisms. The manner these infusoria were taken was as follows: Bands of four goose quills, open at both extremities, were inserted in the end of the iron rod which pierces the bottom; a small valve permitted the water to flow through them a they went down, but closed as they came up. These quills pierced the bottom, and were filled with the adhesive fine clay of the ocean bottom containing the minute organisms.

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TO CORRESPONDENTS.

B. F. S., of Ct.—Gas has been made in connection with a stove; you could only claim some new apparatus for generating the gas.

J. D. B., of Pictou, N. S.—Your plan for extinguishing fires in ships will accomplish the object, but it is not new, for chalk placed in the hold of a vessel to generate carbonic acid gas, by pouring dilute sulphuric acid through lead pipes, upon it, has been proposed to us many times during the past eight years.

T. J. F., of N. H.—Your explanation of the floating of very heavy logs, by spiking and then chaining them to lighter ones, in a raft, is, we think, a good explanation of the way persons may have been led into the mistake of supposing that the spiking of them was the cause of their being made to float.

J. W., of Pa.—Whenever Congress is properly organized, we will publish your article on a reform of "weights and measures."

W. G., of N. Y.—Your plan of condensing and storing up air in strong vessels, to be used under pressure as a motive agent, would be exceedingly difficult to accomplish and on the whole more expensive than steam power.

J. W., of Pa.—Yours will receive attention.

S., of N. Y.—We never publish questions like the one you have sent. It is a suitable one for an educational paper.

E. A. D., of N. Y.—The pens that you send us are said to be coated with a solution of india rubber or gutta percha. We do not understand how it is prepared, but we do not regard it as of much importance.

J. C. P., of Ohio—A turn table operating upon the principle of a double inclined plane, is not new. It has been used in this country, and a model of it was exhibited by an Englishman, at the Crystal Palace Fair.

J. W. P., of Ill.—You seem to have confidence that you can beat Baron Munchausen on big guns. We have no doubt you can do so, for we esteem the Baron as a humbug. If you will send us a sketch and description of yours, we will examine into its supposed merits and advise you. We hope your efforts to get the Russian Government to adopt it will be successful.

J. S. L., of N. Y.—You can no doubt work an engine at some distance from your water wheel, by forcing compressed air through a tube, but you will find it very difficult to keep your tube and engine air-tight. Water falls 25 feet in 1 25·00 seconds; 50 feet in 1 76·100 seconds.

W. W., of San Francisco—For your fine list of subscribers from the Sandwich Islands,—accompanied with a check for $25, accept our thanks. As you have made no claim to a deduction from the regular subscription price, although entitled to it at our club rates, we have entered your own subscription for two years, instead of the one as ordered by you, and sent you the back numbers.

R. H. McC., of Pa.—A patent could not be secured on your machine. It is neither more nor less than what is described in many mechanical Cyclopedias as the "Water Pressure Engine." It would be useless for you to apply for a patent, as an application would be unsuccessful.

J. L. H., of Ohio—We are not aware that any one in Syracuse is getting up a new work on Metal Working.

G. McC, of N. B.—We fear that no patent can be secured on your instrument; it seems to be nothing more than the application of a telescope to the circumferentor, and such application could not be considered the proper subject matter of a patent.

H. P., of Mass.—Your rotary valve is somewhat different from any others we know of, and it is likely a patent can be secured, though the result of applications for patents on valves is somewhat uncertain, owing to the great amount of ingenuity which has been already directed to their improvement. There are rotary cylinder valves in use, one was long ago patented by T. Goodrum, Providence, R. I., having a variable cut-off within it.

C. S., of Mass.—An engraving of your seed planter would cost you $10. If you send your model please to accompany it with the Letters Patent also, which will greatly facilitate the draughtsman in putting the drawing upon wood.

D. G., of Ky.—We shall not be able to announce the award of Prizes in the Scientific American before week after next, owing to the fact of our being obliged to put the paper to press two days prior to the first of January. It takes two Adams' presses three days to work our edition, and should we defer putting the paper to press till the day after New Year's, as you suggest, we should expect to hear more grumbling from the thousands that would not get their papers as early as usual, than the few competitors for the prizes could make at the delay of the announcement for only a week.

C. C., of Ct.—You have a right under the patent law to construct and sell your invention for a period of two years previous to applying for the patent without invalidating it, but we warn you not to do this. In our experience as patent agents we can call to mind several cases where inventors have been subjected to a vast deal of trouble in defending their rights against subsequent inventions of the same character, which they would have avoided if their applications had been prosecuted without delay. You had better send on your model, and we will attend to the preparation of your case at once. Send the model and patent fee by express, and as soon as received we will lose no time in getting your claim before the Office. Inventors make themselves much unnecessary trouble by delaying their applications.

J. W., of Mass.—An invention belongs to its originator, and cannot be claimed by the firm of which he may be a member, unless there are stipulations in writing, or some proof that the invention was brought out for the benefit of the firm.

R, W. B., of Geo.—We do not know anything about the scheme of Prof. J. Woodman Hart, nor of his paper, the "Whole World." His name is not in the City Directory.

A Subscriber is informed that his communication cannot be acted upon for the reason that his name is withheld. We cannnot file nor preserve papers sent us without the writer's name.

H. B., of Ct.—We are pleased to learn the result of the trials with your patent valve. They are highly satisfactory. We would advise you to have engravings published and the facts made public in connection therewith.

S. V., of Ky.—You do not appear to be aware of the fact that a divided axle for facilitating the turning of curves, has often been suggested. It has also been tried, and has been condemned, it is said, for the reason that it increased the liability of throwing the cars off the track. Your device for coupling the cars seems to be a novelty, as we never saw anything like it. We do not discover that it has any advantages over other inventions for the purpose, and we would advise you to pass it.

H. C., of N. Y.—We can give you the information requested regarding the dressing of quills for writing, but a description of the process would require considerable space. We described the process on page 384, Vol. 3, Sci. Am.

A. McL., of Tenn.—The bronze of the ancients was composed of copper and tin, which makes a very hard alloy.

J. J. H., of Ky.—The sketch of your device for exhibiting jewelry and fancy articles in shop windows has been carefully examined. You are doubtless aware that no claim could be set up for driving an apparatus of this kind by clock work. The point you intend to claim is evidently the revolving reel for suspending the articles having suspension rods hung loosely in journals, for the purpose of keeping the articles always in the same position. This peculiar feature does not, in our opinion, present any basis for a patent. We have seen portable book cases constructed on the same plan. The shelves are hung in journals, and whenever the frame rotates, the shelves are always kept in a horizontal position. The mere change of use could not be considered as an invention, therefore you have no hope of securing a patent for it.

Money received at the Scientific American Office on account of Patent Office business for the week ending Saturday, Dec. 22, 1855:—

J. W. W., of N. Y., $30; F, & B., of Pa., $30 W. & G. B., of Pa., $30; L. & W., of O., $30; R. W., of Ct., $30; S. S. T., of Pa., $30; O. L. R., of N. H., $27; M. & B., of S. C., $25; W. S., of N. Y., $250; S. B. D., of N. Y., $150; T. C. H., of N. Y., $5; B. J. B., of N. Y., $25; J. W. T., of Ala., $30; T. W. L., of N. Y., $25; F. S. C., of Mass., $27; E. D. L., of Mass., $100; J. C. T., of Ct., $25; G. & J., of N. J., $30; J. B., of Pa., $10; A. P. C., of Mass., $22; A. P. C., of N. Y., $30; S. D. S., of Mass., $35; C. H. W., of R. I., $20; H. R., of N. Y., $1100; E. H., of N. Y., $30; O. G. G., of N. Y., $20; F. B. G., & Co., of Wis., $20; A. F. W., of N. Y., $10; F. R., M.D., of N. Y., $30; A. A., of N. Y., $30; H. B. S., of Vt., $30; J. A. A., of L. I., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Dec. 22:—

F. & B., of Pa.; M. & B., of S. C.; S. S. T., of Pa.; O. L. R., of N. H.; J. A. A., of L. I.; T. C. H., of N. Y.; B. J. B., of N. Y.; J. B., of Pa.; T. W. L., of N. Y.; F. S. C., of Mass.; A. P. C., of Mass.; E. B. C., of R. I.; O. G. G., of N. Y.; G. E., of Wis.; J. A. P., of Mass.

Important Items.

Going Rapidly—The back numbers of the present volume are fast being exhausted, and those who desire the numbers of Vol. 11 complete, must not wait much longer before remitting their subscriptions, else they will be disappointed.

Models—We shall esteem it a great favor if inventor will always attach their names to such models as they send us. It will save us much trouble, and prevent the liability of their being mislaid.

Subscribers or exchanges who are entitled, to the paper and fail to receive it regularly are desired to inform us that any omission may be corrected. Missing numbers are furnished gratuitously where the fault rests with the publishers.

Patent Claims—Persons desiring the claim of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office stating the name of the patentee, and enclosing $1 as fees for copying.

Literary Notices.

Facts Against Fancy, or a true and just view of Trinity Church—This pamphlet embraces a statement of facts, by Wm. Berrien, D. D., in regard to the management of the Trinity Church property since its foundation in 1697. The property now held by this corporation within the limits of the city of New York, amounts to several millions of dollars, and there is a large class of persons who are interesting themselves in getting hold of it, while, on the other hand, the Church is equally anxious to retain it. With the merits of the controvesy we are strangers. We are, however, much obliged to Dr. Berrien for his pamphlet of "facts," as they show forth an interesting feature in the history of this venerable church, and of the manner in which its funds have been employed. It is no credit to the Church, however, that they have done what they have for charitable purposes. It has a great duty to perform, and instead of doing less, it should do more towards spreading the Gospel in destitute regions.

London Quarterly Review—The present number of this Review, published by Leonard Scott & Co., No. 54 Gold street, this city, contains some fine articles. The concluding one is on Pittand Fox, and contains many interesting reminiscences of these great statesmen and orators. An article reviewing the works of Arago and Brougham on Men of Science, contains a vast amount of useful information relating to the progress of science. It is an excellent number in every respect. This Review is conservative in politics, and is ably conducted. This is an excellent time—near the end of another year—to subscribe for that galaxy of foreign literature, the "Four Quarterlies and Blackwood," published by Leonard Scott & Co.

Hunt's Merchant Magazine for December, closes its Thirty-third Vol., and exhibits no signs of decay. It aggregates within the space of twelve months an astounding pile of figures, and a great mass of valuable commercial and scientific information concerning the trade of the world. Its editor, Freeman Hunt, is an indefatigable laborer, and deserves credit for his devotion to the dry and husky facts that so much affect the welfare of men and nations.

The Home Magazine for December, is a genial, pleasant, and cleverly managed monthly. Edited by the well-known T. S. Arthur, Philadelphia. $2 a year.

National Magazine for January—Carlton & Phillips, 200 Mulberry street, New York. A good number, and well illustrated.

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Over *three thousand* Letters Patent have been issued, whose papers were prepared at this Office, and on an average *fifteen*, or *one-third* of all the Patents issued each week, are on cases which are prepared at our Agency.

An able corps of Engineers, Examiners, Draughtsmen, and Specification writers are in constant employment, which renders us able to prepare applications on the shortest notice, while the experience of a long practice, and facilities which few others possess, we are able to give the most correct counsels to inventors in regard to the patentability of inventions placed before us for examination.

Private consultations respecting the patentability of inventions are held free of charge, with inventors, at our office, from 9 A. M., until 4 P. M. Parties residing at a distance are informed that it is generally unnecessary for them to incur the expense of attending in person, as all the steps necessary to secure a patent can be arranged by letter. A rough sketch and description of the improvement should be first forwarded, which we will examine and give an opinion as to patentability, without charge. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country.

Circulars of information will be sent free of postage to any one wishing to learn the preliminary steps towards making an application.

In addition to the advantages which the long experience and great success of our firm in obtaining patents present to inventors, they are informed that all inventions patented through our establishment, are noticed, *at the proper time*, in the Scientific American. This paper is read by not less than 100,000 persons every week, and enjoys a very wide spread and substantial influence.

Most of the patents obtained by Americans in foreign countries are secured through us; while it is well known that a very large proportion of all the patents applied for in the U. S., go through our agency.

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TECHNICAL DICTIONARY—In the English, French, and German Languages; by Messrs. TOLHAUSEN & GARDISSAL, Civil Engineers. Ready (first part,) French, English, German, price $1,31; (second part) English, French, German, price $1,50. These volumes are designed for the general use of Engineers, Artists, Manufacturers, Foremen, Artizans, in short, of all those who, in some way or other, are concerned in Arts and Manufactures. The present work is the key through which the foreign reader may penetrate into a language which he may know but imperfectly; it is the instantaneous translator of the corresponding technical term, or its equivalent, in the three great industrial languages.—For sale at the Scientific American Office

BREAST WATER WHEELS—For sale, three Wrought iron Under-shot Water Wheels,—one 14 feet diameter and 3 feet wide; the other two about 12 feet diameter and 2 1-2 feet wide. Either can be made into breast or over-shot wheels at little expense. Terms moderate. Apply to D. WHITNEY, New Haven, Ct. 15 6*

WANTED—Four or five traveling and stationary agents, to sell patents and machines of several late improved agricultural implements needed by every farmer. For particulars apply to JESSE URMY, Wilmington, Del. 15 2*

RAILROAD SHUTTERS FOR STORES—An improvement in the above line was patented August 28th, 1855. Those wishing to use this improvement can be accommodated on reasonable terms by applying to the patentee and manufacturer, D. ROHAN, No. 7 Jackson st, Cincinnati. Ohio. 14 4*

1855-6.—WOODWORTH'S PATENT Planing, Tonguing and Grooving Machines.—The subscriber is constantly manufacturing, and has now for sale the best assortment of these unrivalled machines to be found in the United States. Prices from $35 to $1450. Rights for sale in all the unoccupied Towns in New York and Northern Pennsylvania, JOHN GIBSON, Planing Mills, Albany, N. Y. 14 3m*

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CHARLES W. COPELAND,
43 eowtf Consulting Engineer, 64 Broadway.

NOTICE TO PLOW MANUFACTURERS.—JOSHUA GIBBS, of Canton, O., has invented a machine for Grinding and Polishing plows. By addressing the patentee, a cut and directions for making and using will be forwarded; also the term of three months will be granted to test its utility and advantages. Cost for erecting the machine will not exceed $15. 12 8*

OIL SAVER—Save 75 per cent of your oil by using Devlan, Wood, & Hancock's Patent Oil Saver. For particulars and right to use in machine shops, factories, &c., and on railroads, apply to S. C. HILLS, 12 Platt st., New York. 12 L

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NORCROSS ROTARY PLANING MACHINE—The Supreme Court of the U. S., at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb, 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks is not an infringement of the Woodworth Patent.

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Science and Art.

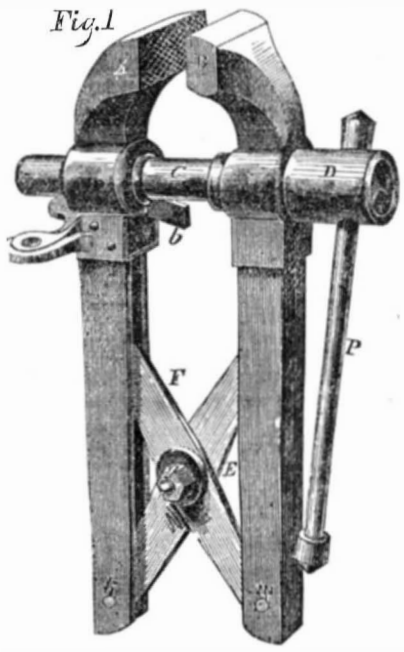
Improvement in Vises.

The accompanying engravings illustrate the improved parallel Vise, for which a patent was granted to R. W. & D. Davis, of Yellow Springs, Ohio, on the 28th of August last, and for which patents have also been obtained in Europe.

Fig. 1 is a perspective view of the improved iron vise. Fig. 2 is a central vertical section, showing the inside of the jaws. Fig. 3 is a horizontal section, at *x y*, fig. 5, looking down on the cross levers in their recesses. Fig 4 is a plan view, to illustrate the application of the improvement to a wooden vise; and fig. 5 is a direct vertical section of the vise, taken through the center.

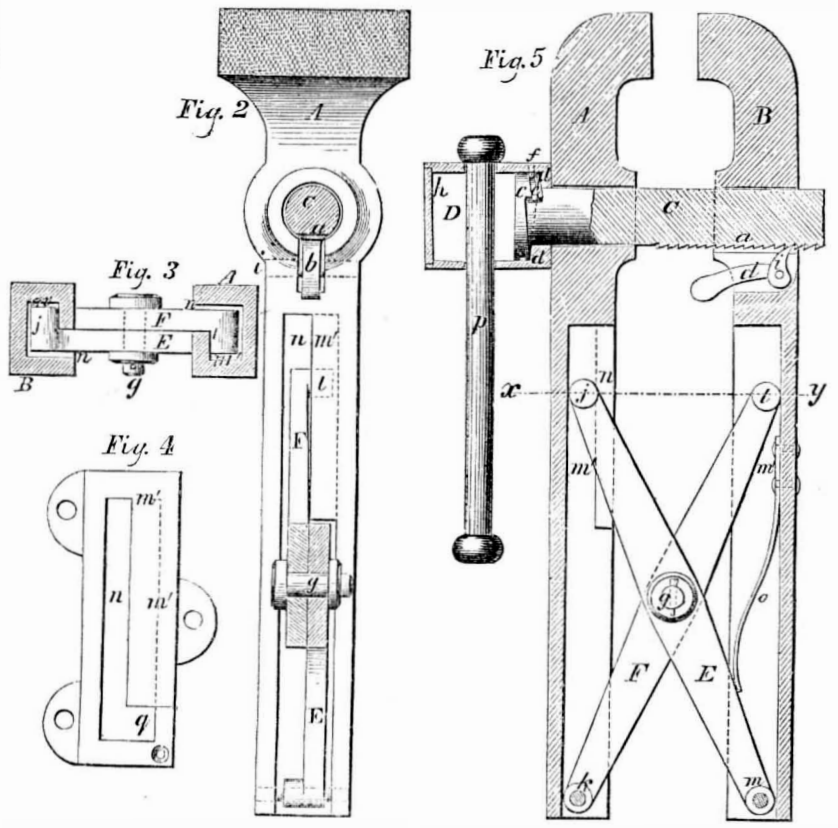
The nature of the improvements embraced in this patent consists, 1st, in the novel means of operating the movable jaw of the vise, dispensing entirely with the common jaw screw, whereby the vise can be moved more rapidly to open and close the jaws, to grip and set free articles to be filed or otherwise acted upon in the vise. 2nd. In the peculiar mode of keeping the movable jaw always parallel with the stationary one.

A is the stationary jaw of the vise, secured by any known means to a bench, and B is the movable one. These jaws are made of iron with steel faces, thoroughly welded to the iron. C is a horizontal strong iron beam, which is substituted for the screw bolt in the common vise. It fits in a suitable opening in the jaws. Its lower side is flattened, and on part of its length has fine ratchet teeth, *a*, cut on it. To act in this ratchet of the bolt, C, in a proper manner, there is provided a peculiar pawl, *i*, fig. 5, having a trigger, *b*, fig. 1, to set it free. This pawl fits in a recess in the shank of jaw, B, and it will be observed in fig. 5, that the bite of the pawl—owing to the peculiar mode of its set—has no tendency to wear the ratchet teeth on the beam, as the pressure comes upon it nearly vertical. The beam, C,



is prevented from moving to open the jaws by placing the finger on the heel of the trigger, *b*, the pawl is relieved, and beam C can then be pushed in, to close the jaws. The beam, C, is made with a solid head, *c*, the face of which next the jaw, forms one or two turns of a spiral or screw. This head is received in a loose box, D, which is formed with a shoulder, *d d*, fig. 5, to come between the spiral face of the head, *c*, and the movable jaw. The face of *d*, next to the jaw, A, is flat, but the other face next *c* is of a spiral form, to correspond with the inner face of the head, so that by turning the loose box, D, with the common lever, P, the spiral face of this box acts as a wedge between the head of the beam, C, and the movable jaw, A, fig. 5, forcing the latter towards the stationary jaw. The rise of the spiral faces should be greater than the distance between the adjacent teeth of the ratchet, about two or three times that distance. The head, *c*, has a spiral groove, *e*, which receives a small pin *f*, projecting from the interior of the box. One object of this pin and groove is to draw back the box when it is turned in the reverse direction to that in which it is turned, to force up the jaw, B; and the pin also serves as a stop, to prevent a complete revolution of the box on the head, *c*, which would cause the grip to be lost. In order to apply the box to the beam, C, the former is made with an opening in the front, large enough for the beam to pass through it. This opening is closed by a cap, *h*, after the beam has been put in the box. When an article is to be fastened in this vise, it is placed against the stationary jaw, and the movable one is simply pushed forward with the beam, C, until it comes in contact with the article. The pawl, *i*, fig. 5, admits of the forward movement of the bolt, and it will hold the jaws closed. A partial turn of the box, D, now wedges the movable jaw, and causes the article to be held firmly between A and B. By reversing the motion of the box, D, after the

DAVIS' PATENT PARALLEL VISE.



article has been operated upon, it is set free. By simply raising the heel of the trigger, *b*, the pawl is thrown out of catch with the ratchet, *a*, and the jaws may be opened as wide as is desired.

We will now describe the mode of connecting the jaws, A B, to keep them parallel. E F are cross levers of equal length, connected by a fulcrum pin, *g*. They form the diagonals of a regular parallelogram, consequently, as each jaw is secured to one end of a lever they always remain parallel. It is, however, the arrangement of these diagonal levers to give an uniform leverage in this vise, which is the novel feature. To effect this, their lower extremities are secured to the bottom of the jaws by pivots, *k* and *m*, which pass through the feet of the jaws, and do not move out of place. The upper ends of the levers, E F, are formed with horns, *j l*, and are fitted in recesses, *m' m'*, in which they are confined laterally, but allowed to slide up and down. The sides of the legs of the jaws have slits in them, which allow the edges of the levers, E F, to play, while the horns, *j l*, are confined within the recesses, *m'*. They (the levers) can, however, be taken out and put in by uncoupling the jaws, and throwing them sufficiently wide apart to allow the upper ends of the levers to come below the flange part, *n*, of jaw A, fig. 5. By the connection of the lower ends of the levers, E F, with the lower ends of the jaws, A B, of the vise, the jaws have a uniform leverage. If the levers were connected to the jaws at the top, instead of in the manner described, the leverage would not be uniform, but decrease as the jaws were moved apart from one another. A spring, *o*, is applied between the stationary jaw and lever E, for the purpose of forcing open the jaws at once when the pawl is released from the ratchet. This spring is only necessary when the jaws are very near together, as the weight of the levers themselves tends to force them apart when they are set out from an upright position; this depends on the thickness of the article enclosed between them. In this manner they are self-opening.

In applying these improvements to a wood vise, all the parts, with the exception of the jaws, are made like the parts already described. The jaws may be of the usual form of wood vises, or any other form. A cavity is made in each to receive the upper horned ends of the levers, E F. An iron plate, of the form of fig. 4, is attached by screws to the outside of the cavity to confine the horns, this plate having a slot, *n*, in it, and a large opening, *q*, at the bottom for the introduction of the horned ends of the levers, and for their removal when necessary.

A vise that would preserve its parallelism without being expensive and complicated, has long been a desideratum with mechanics, and many devices have been proposed to effect it, but they have been generally discarded, either for their complexity or expense. This vise can be opened or closed in one-tenth the time required to open or close a vise operated by a screw, and is more durable in its use and simple in its operation. By the action of the cross levers the movable jaw is always secured in a parallel position to the stationary jaw, which is a superior improvement on the method of operating vises. These vises are made of the best materials, and are manufactured by the patentees, from whom more information respecting them may be obtained, or by letter addressed to their general agent, Wm. H. Schoffeild, at Yellow Springs, Green Co., Ohio.

The Monster Mortar.

We have every reason to believe that the difficulties experienced in constructing a monster gun or mortar are likely to be overcome through the genius and skill of our scientific countryman, Mr. Robert Malet. The attempt to weld together longitudinal bars so as to form a cylinder, failed in the hands of one of the ablest English engineers, from the circumstance that the long-continued high temperature maintained during the progress of welding, produced a tendency to crystallization, and therefore, was destructive of that fibrous structure essential to the strength of iron for artillery purposes. In Mr. Malet's mortar the cylinder is formed by a series of flat rings, fitting on one another by flanges, and clamped together by strong external bolts. The force exerted by the explosive gas is chiefly lateral, and not longitudinal; that is, it has a tendency to burst the cylinder in a direction at right angles to its axis, and only a small force, comparatively, to separate these rings in a direction parallel to the axis. One of these mortars has been completed at Millwall, and the shell already cast. The dimensions are startling. Instead of the 13 inch shell (the largest hitherto,) weighing about 200 lbs., and carrying 30 lbs. of powder inside, we are to have a shell of 36 inches diameter, weighing about 2,400 lbs., and charged with half a tun of gunpowder. The range will be about half as far again as that of the 13-inch mortar. Hence, a dozen such shells would have left Sebastopol in ruins.—[Dublin Daily Express (Ireland.)

[We wonder if Robert Malet has been a reader of the Scientific American, if so, he will not claim the above mortar as his invention. Probably he does not, and the editor of the Dublin *Express* may, in absence of correct information, be giving him credit for an invention which he does not claim himself. At any rate, he is not the original inventor of the above described method of constructing mortars or cannon, and thanks to the records of the press, we can furnish undeniable proof of our assertion by referring both him and our Dublin cotemporary to an engraving illustrating the invention on page 220, Volume 2, Scientific American. We saw a cannon constructed upon this principle, on exhibition in this City in 1848. The inventor is D. Fitzgerald, of this city, to whom was granted a patent for it eight years ago.

Land Anchor for Carriages.

In 1802, Mr. Richard Pattinger took out a patent for a carriage anchor. Its object was to prevent accidents from runaway horses. When the animal got into a dangerous speed, the plan was to throw the anchor out of the carriage, and so bring it to a stop. The anchor was tied by a rope or chain to the vehicle.

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MECHANICS

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